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NEW HEADQUARTERS

FOURTEEN years elapsed between the initial proposal—recorded in one of the earliest issues of the *Journal* in 1849—to form what ultimately became the Institution of Gas Engineers and the fulfilment of those early hopes in 1863. We move with much greater acceleration today. Within two years from the first step, in Dr. Harold Hartley's Presidential year, to acquire a permanent home for the Institution, sufficient funds had been raised to purchase the lease of the premises in Grosvenor Crescent and to endow the headquarters in perpetuity, the premises were suitably furnished, and the house was well and truly opened with the blessing of both the Minister of Fuel and Power and his Parliamentary Secretary, each of whom had a part in the ceremony last Thursday. Ideally suited to its new purpose, the house at 17, Grosvenor Crescent had for half a century been a centre of public service rendered by private enterprise. From now onwards it will serve the professional and benevolent interests of those who, in turn, devote their lives to public service under a nationalised industry.

It was evident from the earliest hints of nationalisation of the gas industry that the Gas Council would sooner or later need all the accommodation that Gas Industry House could offer, and that apart from the sheer necessity of finding somewhere to accommodate the offices and library it would be in the highest interests of the Institution to have a home of its own, where it could work quite independently of the official machinery of the industry. It might have moved miles away from G.H.Q. but it sought and found a home within a few yards from 1, Grosvenor Place.

Entirely different in their functions, the Institution and the Gas Council are not on opposite sides of a fence. They are, as Sir Edgar Sylvester emphasised at the opening ceremony, partners in a great enterprise, and both are ready and eager to co-operate in promoting the interests of gas consumers and the welfare of those who serve the technical side of the industry. Both are on new ground. The Gas Council and the area boards, having completed their first year of operation, are preparing their reports for submission to the Ministry. The Institution is enhancing its dignity by accepting the District Associations as District Sections. The high qualifications necessary for the various classes of membership will be maintained, but in the initial stages those who, by reason of their service to the industry, have been welcomed into District Association membership without having, in every instance, attained the technical qualifications laid down in the Institution rules, are to be accepted into an appropriate grade of membership.

BRITISH COKE RESEARCH

ON later pages we publish an account of the official inauguration by the Earl of Halifax of the Midland Coke Research Station at Sheffield last Thursday. It was an important landmark in the story of coke research in this country and we were glad to have the opportunity of seeing what is being done there, for since the inception of the Midland Coke Research Committee in 1926 we have followed closely the development of a very steady, very sincere, organisation which led to the incorporation of the British Coke Research Association in 1944. Shortly after the formation of the Midland Committee came the setting-up of the Northern Committee and the Scottish Committee in Glasgow, and throughout we have seen another noteworthy example of practical co-operation between the modern Universities and utilitarian, though imaginative, industry. The Midland Committee was housed for long at Sheffield University, the Northern was linked to Armstrong College, at Newcastle (now King's College, University of Durham), and that arrangement in regard to the Northern holds today. The Scottish organisation works in conjunction with the Royal Technical College, Glasgow. With the incorporation of B.C.R.A., financing of research work for the coking industry was undertaken by the British Coking Industry Association with the support of the Department of Scientific and Industrial Research. Centralised control and co-ordination of research activities on coke became the responsibility of the Council of the British Coke Research Association.

From the beginning B.C.R.A. has, from the publicity angle, been reticent rather than forthcoming. That it has planted its feet firmly we have no doubt; that its work is guided with good sense and first-class brains we are certain. We feel, however, that—to put it loudly—it might to its advantage and to that of the back-room boys employed by it blow its trumpet more frequently. There is no reason for B.C.R.A. to be so mutely modest. The names of those connected with hard coke research during the past quarter of a century are known to the majority of our readers. For

present record we would mention that the Director, with headquarters staff in London, is Mr. G. W. Lee, that the new Midland station is under the control of Dr. R. A. Mott, whose written word on coke is almost law, that at King's College, Newcastle, we have Professor Wynne Jones and Mr. H. E. Blayden (of Riley and Blayden fame), and in Glasgow Professor R. Hay.

Purposely we have sketched the present set-up of B.C.R.A. as a whole. Last Thursday was Sheffield's special day, a Midland coke festival. The arrangements made for the visit of many distinguished in Government, civic, educational, scientific, and fuel technology spheres were wholly admirable—surely a reflection of the efficiency of the Association. The obvious interest taken by the visitors was the Association's just reward. We will not dwell here on the new Midland Station of B.C.R.A.; it is described later in our issue today. But we would mention that it is readily accessible from the centre of Sheffield and from the University to which the Association would be the first to admit that it owes a very great deal. The liaison between the Association and the University is unbroken. The premises are leased from the Corporation of Sheffield, one of the hearts of the hard coke industry; and here again the link between civic work (and pride) and scientific and technical aspiration was never stronger. From a research worker's point of view the premises, 'Lynwood,' standing in its own grounds, must offer great advantages. Thursday, May 4, was a great day for the Midland section of B.C.R.A., and, of course, for the Association as a composite entity.

OVERLAPPING OF RESEARCH

FOR many years there has been discussion, not without foundation, on the vexed question of the overlapping of research. The subject has received more emphasis since nationalisation of the fuel industries, and many have asked what is going to be the future of the Fuel Research Board in relation to the Ministry of Fuel and Power and to the research organisations of the nationalised industries. Early this year the then Minister of Fuel and Power, Mr. Hugh Gaitskell, explained the setting up of the Chief Scientist's Division in 1948, the aim of which is not only to encourage, support, and co-ordinate research and development in the field of fuel and power, but actually to direct research in those parts of the field which it is considered, rightly or wrongly, are not otherwise provided for. Underground gasification and the heat pump are examples; and a good deal of money seems to be being spent by the Division—a fact which has given rise to comment and criticism.

The subject was clarified in a speech by Engineer Vice-Admiral Sir Harold Brown, Chairman of the Fuel Research Board, in a speech as chief guest at the annual luncheon of the Institute of Fuel, a report of which appears on a later page. A major duty of the Board, he said, is to advise on the research work of organisation of the Department of Scientific and Industrial Research carried out at the Fuel Research Station, assisted by various extra-mural bodies. It was laid down some years ago by the Advisory Scientific Council that the D.S.I.R. should retain the prerogative to initiate research on fuel, and it would retain its responsibility in this regard, the while undertaking work for the Ministry of Fuel and Power, the Service departments, and the Ministry of Supply. And, added Sir Harold Brown, in regard to overlapping of the work of the Fuel Research Board and that of the research organisations of the nationalised industries, it should be no more difficult, and probably it would be easier, to prevent duplication now than in the past. Through the Advisory Council the Ministry of Fuel and Power has the specific duty of watching these various organisations to prevent unnecessary duplication, and Sir Harold made it plain that close relations had been established unofficially between the D.S.I.R. and the other research bodies. An advantage of the current arrangement is that it leaves the D.S.I.R. free to study fundamental and basic problems concerning fuel. In any case it is obviously desirable to have in existence an advisory body free from sectional interests. As to the criticism that the D.S.I.R. has not carried out sufficient fundamental research, Sir Harold pointed out that during the war and post-war periods the stress had been on immediate problems; and he firmly believes that the position will gradually right itself.

FELIXSTOWE MEETING

FIVE years ago the Eastern Association of Gas Engineers and Managers was the first of the District Associations to meet in post-war 'peacetime,' just two days in fact after the end of hostilities in Europe. Last week it was the first to meet after the first anniversary of nationalisation. Although the background of the two occasions was different there was a similar sense of achievement and anticipation. The industry was in a period of transition in 1945; it is in another period of transition in 1950; in fact, it has never been otherwise, but the Felixstowe meeting had features which will make it historic. For its first 61 years the Association comprised the engineers and managers of from 100 to 200 mainly small municipal, company, and holding-company undertakings. Since last May its personnel has remained very much the same, but all the members, save the small minority who represent the contracting side, now serve one employer, the Eastern Gas Board, or perhaps the area boards immediately adjoining the Eastern counties. From July 1 it will cease to be an Association affiliated with the Institution and will become the Eastern District Section of the Institution, with its first officers appointed by the Institution, who will doubtless have due regard to the wishes of the members in regard to their selection.

Family ties have been strong in many of the Eastern undertakings, the case of this year's President, Mr. C. E. Grimwood, now filling the chair to which his grandfather was appointed in 1895, being a classic example. In such cases the advent of nationalisation was viewed with misgiving, yet on Friday Mr. Grimwood was able to record that the whole area was settling down happily under the new régime. The fact that Sir John Stephenson, Chairman of the Eastern Gas Board, was present throughout the proceedings was an earnest of the goodwill between the area board and its officials of all ranks. Like all his colleagues on the Gas Council, Sir John is not indifferent to the value, both technically and socially, of such meetings as that at Felixstowe, and the members need have little fear that

there will be any new restriction on the facilities for attending future meetings. As a District Section of the Institution the Association will lose little independence and will gain substantially by the closer tie with gas engineers in other parts of the country.

INDUSTRIAL GAS FURNACES

EVERYTHING points to a great increase in the future in the use of town gas in industry. Expectations in this direction only a few years ago have been far surpassed in the event. Industrialists have a new attitude. They favour that fuel which in service gives them the most economical cost of production of the finished goods, which does not imply the use of a fuel necessarily the cheapest in relation to other fuels or sources of energy. We know of industrial centres today where there exists a demand which, if it could be satisfied by the gas industry, would increase industrial consumption in those areas immediately by anything up to 20%. Unfortunately, at present demands cannot be met, due solely to lack of the necessary gas-making plant. But the leeway must be overtaken. This condition, this clamant demand, has an obvious corollary. It is that the development of the industrial gas load, and indeed its maintenance, call for trained men in number as never before in the gas industry's history. The prospects for such men are exceedingly bright.

In the May issue of *Gas Service* we start a new series on the use of gas in industry. The author who has prepared this series is an industrial gas engineer of long and wide experience, and he has the happy facility of being able to impart his knowledge in the clearest of terms. The author is Mr. Irving Greenwood, of Stoke-on-Trent. The articles are severely practical. The field covered includes the operation and construction of gas-fired equipment for metal melting and heat treatment, for pottery firing, for steel, non-ferrous and light alloys, annealing, normalising and hardening, refractories and furnace design, including insulation. The series will be profusely illustrated by line diagrams and photographs. It will prove of great value not only to those aspiring to be industrial gas engineers and to students, and those who have lately embarked on a career in the sphere of industrial gas usage, but to those who are already in the field.

252 COMMITTEES !

WE have before us the 'annual report issue' of the American Gas Association *Monthly*, a magazine for which we have regard and affection. This particular issue, however, seems to us to over-reach itself. Obviously a layout man or a team of layout men was allowed 100% freedom. Whoever was responsible for laying out in photographic and diagrammatic form the working of A.G.A. in 1949 no doubt had a joyride for his dollar, but he was contemptuous of the reader of the mass of statistics it was his happy lot pictorially to disclose. The printed word is almost obscured by the overlay of tint. Only our National Health lens, coupled with considerable patience, made it possible for us to decipher the message. But we learn that A.G.A. is one of the 10 largest trade associations in the United States. The industry it serves ranks among the first half-dozen in the country. The 1949 budget of this 'voluntary, non-profit organisation' topped three million dollars; and 'under the direction of an executive board elected by company members, the Association's programme was sensitive to the industry's most vital needs.' This is a proud, though, we are sure, a just, claim. We were not surprised, though we think we should record, that there are 252 active committees of the American Gas Association. The Association appears to be proud of this achievement. Perhaps the number of committees, and the pride in them, will increase in 1950. We hope not, because we believe that the committee system should be curbed.

It is argued in the United States and similarly in Great Britain that those who sit on voluntary committees are unpaid for their work, that they are animated by the cause of work for work's sake. A moment's reflection shows that this argument is manifestly absurd. As far as the gas industry of Great Britain is concerned those who sit on committees, of which there are too many, sit on a time basis on the salaries they earn from the posts they occupy. If Mr. X devotes half his waking and working hours to voluntary committee activity, then he must be working half-time in his accredited job for which he is drawing full-time salary. In other words, whole-time occupational personnel who spend half their time sitting around the round table are having their efforts in this direction subsidised by the units of the nationalised industry to which they are attached. Committees, in fact, though professedly voluntary, cost a great deal of any industry's money; and the more numerous the committees, the more frequent their meetings, the more drawn-out their proceedings, the fewer their recommendations which are put to practical effect, mean in direct ratio loss of valuable man-power on the job.

TRAINING FOR MANAGEMENT

A highly interesting paper on the subject of education and training in engineering management was given this month to the Institution of Mechanical Engineers by Mr. H. G. Nelson, Deputy Managing Director of the English Electric Company, Ltd. The author remarked that in the past the senior and managerial officials of British industry have in many instances learnt their business as it has grown. They have not, he continued, had the facilities of highly developed courses in technology and other subjects which are available today. None can say that they are any the worse for that, but they have grown up with the development of industry whereas the younger generation has now to take over industry as a going concern of considerable size and complexity. If it is to be immediately successful it must have an adequate background against which to fulfil its responsibility. This makes conscious planning for management education essential. However, Mr. Nelson posed a pertinent query: Is there a danger that the provision of the excellent training schemes and courses now current may make it too easy to acquire superficial knowledge without the rough and tumble of experience to make it something worth while? Education must only be a stepping-stone to experience. The danger must not be overlooked that an over-emphasis on attendance at courses and lectures may lead to over-confidence or to a sense of frustration if early promotion is not forthcoming. There is another important aspect which was touched upon by the author. The personal qualities necessary for management do not arise entirely from education and training although they may be developed in this way. Inherent mental and physical qualities and general background, particularly in early life, play a great part, and education and training for management certainly cannot make up for unsuitable human material. Selection of those to receive training is, therefore, as important as training itself.

FIGURES FROM CANADA

OUTPUT of gas from plants in Canada in 1948 amounted to 74,768 mill. cu.ft. In that year, 27 coke oven plants and gas-works were in operation including 14 coal gas and water gas plants and four propane gas plants. A development of the year was, in fact, the conversion of certain gas plants to propane, and the distribution of propane in cylinders is expanding rapidly. Output of coke totalled 3,945,776 tons in 1948 compared with 3,514,151 tons in 1947; of this amount only 266,958 tons was made in gas retorts. In addition, 87,438 tons of petroleum coke was recovered in petroleum refineries and 17,600 tons of pitch coke in coal tar distillation plants.

THE CANTEEN LOAD

THE electrical industry would seem to be casting an eager eye on the potential load in industrial canteens, if a recent editorial in the *Electrical Times* can be taken as indicative of current thought within our sister industry. That such attention should be given is not surprising in view of figures published in the *Economist* which show that the number of industrial canteens has grown from a pre-war total of some 1,500 to over 28,000, serving 15 mill. main meals each week and 54 mill. other meals. To consider the load and to obtain it are, however, two different matters. 'Sales schizophrenia,' in the words of the *Electrical Times,* is afflicting the electrical industry's approach to canteen cooking; there is a very real fear that if industrial consumers are called upon to cut their maximum load by an arbitrary percentage, they will hardly be anxious to install electric cooking at the expense of production in the factory. It is, therefore, likely that the opportunity for expansion may only be taken in part, although reliable estimates show that less than 10% of industrial canteens are equipped with all-electric cooking. The gas industry has a substantial lead in this field; freed from the difficulties confronting the electrical industry, it ought not to be overtaken.

TWO NEW GAS ORDERS

Two new Orders made by the Minister of Fuel and Power under the Gas Act became effective as from May 1. One was the Gas (Ibstock and Kington) (Transfer) Order, 1950 (Statutory Instrument No. 685), under which the property, rights, liabilities, and obligations of the former North Western Gas Corporation, Ltd., one of the smaller holding companies, were transferred to the gas boards in whose areas the Company's undertakings operated. Under the Gas Act these passed to the Gas Council pending division among the appropriate boards. The gas undertaking at Ibstock, Leicester, is transferred to the East Midlands Gas Board, in whose area it lies; and that at Kington, Herefordshire, to the West Midlands Gas Board. The Company's other undertakings were in Wales, and the remaining assets and liabilities are therefore transferred to the Wales Gas Board. The other is the Gas (Consumers' Deposits) (Rate of Interest) Order, 1950 (Statutory Instrument No. 687). It provides that where any money is deposited with an area board by way of security in pursuance of the provisions of the third schedule of the Gas Act, the rate at which the board shall pay interest as provided in paragraph 39 of the schedule shall be 3½% per annum.

Obituary

Mr. **Alfred John Paten,** a director of the former Peterborough Gas Company from 1904 and Chairman from 1927 until nationalisation died on May 4.

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Councillor **Archibald Wells,** J.P., a director until nationalisation of the Long Sutton and Sutton Bridge Gas Company, has died suddenly at the age of 48. He was a member of Holland County Council and Chairman of East Elloe Rural District Council.

Personal

Mr. **F. J. Martin** has been appointed Assistant Secretary of the Eastern Gas Board.

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Miss **Pamela Hands,** Manchester Women's Gas Council organiser, is the new Editor of *Glad Tidings,* the Branch quarterly magazine.

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Mr. **C. E. Parsons,** Engineer, Manager, and Secretary of the Leominster District, West Midlands Gas Board, has retired due to reasons of health. Mr. Parsons had held the position at Leominster since 1918.

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Mr. **W. L. Wright,** Deputy Coal, Coke, and Transport Officer to the South Western Gas Board since vesting day, has been appointed Coal, Coke, and Transport Officer in succession to the late Mr. J. Thornhill, with effect from May 1.

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Mr. **J. E. Matlock,** Manager of the Ashby-de-la-Zouch and Shepshed undertakings, East Midlands Gas Board, who joined the Shepshed gas undertaking 41 years ago, will retire on May 31. At a dinner at the Britannia Hotel, Shepshed, he was guest of the office and works staffs and was presented with a fountain pen and pencil.

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Mr. **F. G. Wicks,** local accountant to the Tunbridge Wells undertaking, South Eastern Gas Board, has retired after almost 51 years' service with the gas industry. Mr. Wicks joined the former Tunbridge Wells Gas Company as a junior clerk in 1899, and was appointed Assistant Secretary in 1931, a position he held until nationalisation when he became local accountant. In recognition of his services he has been the recipient of two presentations, one from the undertaking's staff and employees and the other, at Croydon on May 5, from the Eastern Gas Board.

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Mr. **W. J. Steed** has been appointed Sales and Service Manager of the Warwickshire Division, West Midlands Gas Board. Mr. Steed served with the former Kenilworth undertaking, and was latterly Showrooms Manager of the Coventry District. He served as Organising Secretary to the Ministry of Fuel and Power Efficiency Committee, 1946 to 1949, and was responsible for the formation of the Sales Managers' Association (Coventry Group) in 1948. The Association has elected him Chairman of its education committee, and Mr. Steed also takes over the chairmanship of the West Midlands Gas Salesmen's Circle this year.

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Dr. **F. H. Tyrer,** M.R.C.S., L.R.C.P., has been appointed Industrial Medical Officer to the West Midlands Gas Board. Dr. Tyrer was educated at Shrewsbury, and Gonville and Caius College, Cambridge. After experience in resident hospital posts, he spent a year in the School Medical Service at Stoke-on-Trent, and in 1942 joined the Ministry of Supply as Medical Officer to the Royal Ordnance Factory, Chorley. Five years later, he was appointed Medical Officer to Lever Brothers, Port Sunlight, Ltd. He has been an active member of the Association of Industrial Medical Officers since 1942 and is at present Honorary Secretary of Merseyside Group of the Association.

In our reference to the appointment of sales representatives by William Sugg and Co., Ltd., in last week's *Journal,* p. 302, a final sentence was omitted. This read: 'These arrangements are in addition to the representation already existing in Scotland and Ireland, *viz.,* Messrs. Milne and Mitchell in Glasgow and Mr. T. D. Hamilton in Belfast.' We also referred to sales representatives in the eastern 'countries.' This should, of course, have read 'eastern counties.'

INSTITUTION OF GAS ENGINEERS

PROGRAMME OF 87th ANNUAL MEETING

The 87th annual general meeting of the Institution of Gas Engineers will be held at Bournemouth from June 6 to 9 under the Presidency of Mr. C. H. Chester, O.B.E., M.I.MECH.E., Chairman of the South Western Gas Board. The business sessions will be preceded by a civic reception at the Pavilion on the evening of June 5. Following is a summary of the programme:

MONDAY, JUNE 5

8 p.m. Civic Reception by the Mayor (Councillor S. A. Thomson, J.P.) and Council of the County Borough of Bournemouth, followed by dancing, in the Ballroom of the Pavilion, Bournemouth.

TUESDAY, JUNE 6

9.30 a.m. Civic Welcome by the Mayor of Bournemouth in the Winter Gardens. Opening of meeting. Welcome to representatives from overseas. Adoption of the 87th annual report and accounts (*Communication No.* 363). Scrutineers' reports of the ballots. Presentation of medals.

10 a.m. Presidential Address by C. H. Chester, O.B.E., M.I.MECH.E., M.INST.GAS E., Chairman, South Western Gas Board. (*Communication No.* 364).

10.30 a.m. Presentation and Discussion of paper on 'Civil Engineering in the Gas Industry,' by W. S. Stredwick, M.I.C.E., M.INST.GAS E., Civil Engineer, Western Division, Southern Gas Board. (*Communication No.* 365).

11.40 a.m. Photograph at the Winter Gardens.

12.10 for 12.30 p.m. President's luncheon in the Ballroom of the Pavilion.

3 p.m. Presentation, without discussion, of a Symposium of short papers. (*Communication No.* 370).

4 p.m. Consideration, and, if thought fit, approval by Corporate Members of amendments to the By-Laws of the Institution.

2 p.m. Ladies' visit by motor coach to Corfe Castle, Swanage, and Studland.

WEDNESDAY, JUNE 7

10 a.m. Presentation and discussion of paper on 'The Gas Industry: Today and Tomorrow,' by James Carr, M.C., M.B.E., A.M.I.MECH.E., M.INST.GAS E., General Manager, Northern Division, and Arthur Marsden, M.SC., PH.D., F.R.I.C., M.I.CHEM.E., M.INST.GAS E., Area Scientist, South Western Gas Board. (*Communication No.* 366).

11 a.m. General meeting of contributors to the Benevolent Fund.

11.15 a.m. Presentation and discussion of paper on 'Recent Producer Gas Practice in the Liverpool Undertaking,' by W. S. Hubbard, M.INST.GAS E., Gas Engineer, Liverpool Undertaking, North Western Gas Board. (*Communication No.* 367).

2.30 p.m. Visit by motor coach to the Pitwines works of the Southern Gas Board.

2.30 p.m. Visit by motor coach to Bourne Valley gas distribution centre of the Southern Gas Board.

2.30 p.m. Visit by motor coach to Avon water pumping station of the Bournemouth Gas and Water Company.

2.30 p.m. Visit by motor coach to Alderney reservoir station of the Bournemouth Gas and Water Company.

2 p.m. Ladies' visit by motor coach to the New Forest and Beaulieu Abbey.

THURSDAY, JUNE 8

10. a.m. Presentation and discussion of paper on 'The Utilisation of Gas and Coke,' by F. M. H. Taylor, B.SC., PH.D., ASSOC.M.INST.GAS E., Managing Director Thermocontrol Installation Co., Ltd. (*Communication No.* 368).

11 a.m. Presentation and discussion of paper on 'Gas Water Heating: The Contribution of Testing to Design,' by L. W. Andrew, B.A., B.SC., M.INST.GAS E., Research Chemist, and C. H. Purkis, B.A., B.SC., M.INST.GAS E., Chemist, North Thames Gas Board. (*Communication No.* 369).

12 noon Concluding business of meeting.

12.30 p.m. for 12.45 p.m. Council luncheon to the President at the Carlton Hotel, Bournemouth.

2.30 p.m. Repeat visits to (a) Pitwines works; (b) Bourne Valley gas distribution centre; (c) Avon water pumping station; and (d) Alderney reservoir station.

2.30 p.m. Ladies' visit by steamer round Bournemouth Bay (weather permitting) and the islands of Poole Harbour.

8 p.m. Reception and dance in the Ballroom of the Pavilion.

FRIDAY, JUNE 9

10.15 a.m. Visit to Weymouth and Portland Harbour. Luncheon (12.30 p.m.) at either the Gloucester Hotel or Royal Hotel, Weymouth. Motor coach (1.40 p.m.) to Weymouth Pier for steamer (2 p.m.) to visit Portland Harbour and inspect H.M. Ships and Dockyard, returning to Weymouth Pier (4.30 p.m. for tea); or motor coach (2.15 p.m.) to the Weymouth works of the Southern Gas Board, returning (4.30 p.m.) for tea; or motor coach (2.15 p.m.) to the Whitehead Torpedo works of Vickers Armstrong, Ltd., returning (4.30 p.m.) for tea. Tea (5 p.m.) at either the Gloucester Hotel or Royal Hotel, Weymouth. Weymouth (5.45 p.m.) by motor coach via Wareham, to Pavilion, Bournemouth (7 p.m.).

The S.B.G.I. Golfing Circle will hold its summer meeting at Parkstone Golf Club, Parkstone, Dorset, on June 5, commencing 9 a.m. The programme will be as follows:

During the Day—18 holes medal play for the 'Thornton Victory Cup' for members of the Society of British Gas Industries, and for the 'Coronation Plate' for members of the Institution of Gas Engineers.

Afternoon Only—18 holes foursomes against bogey for prizes presented by a member of the Circle.

The Parkstone Golf Course is on the Poole side of Bournemouth, beyond Canford Cliffs, and is adjacent to 'bus routes.

Diary

May 11.—London and Counties Coke Sales Circle: Annual General Meeting. Gas Industry House. 2.30 p.m.

May 12.—London and Southern Junior Gas Association: 'Carbon Monoxide,' F. E. Mills and F. C. Smith (Watson House). Lecture Theatre, North Thames Gas Board, 178/180, Edgware Road, W.2. 7 p.m.

May 18.—Yorkshire Junior Gas Association: Visit to the works of the Bryan Donkin Co., Ltd., Chesterfield.

May 17.—London and Southern Junior Gas Association: Visit to Shell Refineries, Shell Haven, Essex.

May 18-19.—Wales and Monmouthshire Association of Gas Engineers and Managers: 45th Annual Meeting, Tenby. (First day social functions; second day business).

May 19.—Scottish Junior Gas Association (Western District): Visit to Newton Chambers & Co., Ltd., Thorncliffe, Sheffield.

May 23.—Southern Association of Gas Engineers and Managers: Spring General Meeting. 'Forty Years of Reinforced Concrete with Special Reference to Recent Developments,' E. O. Rose (Divisional Engineer) and W. T. Gedge (Divisional Constructional Engineer, Tottenham Division, Eastern Gas Board. Connaught Rooms, London.

May 24.—Western Junior Gas Association: Visit to works of G. Waller & Son, Ltd., Stroud.

May 25.—Midland Association of Gas Engineers and Managers: Annual and Spring Meeting, Leicester.

May 27.—London and Southern Junior Gas Association: Visit to Mogden Sewage Purification Works, Isleworth.

May 30.—Southern Association of Gas Engineers and Managers (Eastern District): County Meeting. Luncheon at Town Hall, Catford, 12.30, followed by visit to Sydenham Works of the South Eastern Gas Board.

May 31.—Eastern Junior Gas Association: Annual General Meeting and visit to Bedford Gasworks.

June 2.—London and Southern Junior Gas Association: Annual General Meeting. Lecture Theatre, 178/180, Edgware Road, W.2. 7 p.m.

Future of the Fuel Research Board

Sir Harold Brown's Optimistic Outlook

THE Institute of Fuel held its annual meeting and luncheon at the Connaught Rooms, London, on April 27, the President, **Dr. D. T. A. Townend,** presiding. At a further meeting, held after luncheon, he delivered his Presidential Address, in which he reviewed progress in education.

Mr. **J. F. Ronca,** the Hon. Secretary of the Institute, presented the annual report, and was gratified by the increased membership (now totalling 3,550), especially by the entry of the younger men into the Institute. He commented also on education, to which a large part of the Council's activities have been devoted, and to the great activity of the Institute's sections throughout the country.

The accounts, which showed that the the financial strength of the Institute continues to improve, were presented by Mr. **R. H. Gummer** (Hon. Treasurer); and the report and accounts were adopted.

The resolution for the adoption of the report and accounts was proposed by Mr. **C. T. S. Arnett,** who paid warm tributes to the Hon. Secretary and Hon. Treasurer. The papers which had been presented to the Institute, he said, represented a major contribution to increased efficiency in industry at a time when such increased efficiency was of the greatest importance to our country.

The report and accounts were adopted.

As the result of a ballot, the following were elected to fill vacancies on the Council: Mr. H. S. Cheetham, Dr. H. A. Fells, Dr. G. E. Foxwell, Mr. H. R. Hems, Mr. E. G. Ritchie, Mr. F. L. Waring.

Following the annual meeting a special corporate meeting was held at which a resolution was passed to authorise an increase of subscriptions, except in the case of students.

At the annual luncheon, the **President,** proposing the toast of 'The Guests,' extended a warm welcome to the Institute's Past Presidents, to His Majesty's Ministers and members of their departments who were present, to the leaders of industry, the representatives of kindred institutions, and the representative of research and education.

Spreading the Gospel

It was not enough in fuel matters, he said, that we endeavoured to set our own house in order. The situation had national importance and a national gravity in aspects of which our very survival was at stake. It was a situation in which the gospel must be spread, as widely as possible, urging the vital necessity for fuel economy and, beyond that, for correct fuel technology. That, indeed, often returned dividends in a wider and more general field far beyond the limits of fuel economy alone.

The Institute of Fuel, he continued, occupied in relation to many other professional institutions a quite special position. The forum it provided for the exchange and discussion of views attracted substantial support from many members of other institutions, who practised as their first avocation one of the sciences which served their prime calling, or the arts and sciences of a varied range of engineering, but who had given special attention to a common interest with other professions in the proper utilisation of fuel. Chemists of many types met in that way with engineers of similarly wide range, and he trusted that the Institute enabled them to do themselves and the public a service by participation in their common special efforts.

Of the guests who represented education, who included many of his old university colleagues, he mentioned two friends of the Institute particularly. One was Dr. P. C. L. Thorne, of the Ministry of Education, with whom the Institute was in close harmony. The other was General C. Lloyd, C.B., C.B.E., of the City and Guilds of London Institute, who was unfortunately ill. The President wished him a speedy recovery.

Technological Education

Coming back to the importance of professional organisations, he said there had proceeded lately, and even now continued, a good deal of examination and discussion which sometimes, deplorably, had been rather more controversial than constructive on the subject of higher technological education. In that it was the Institute's strong desire to be constructive. Universities and technical colleges agreed that the complete qualification of the fully trained professional man could not be the sole responsibility of such educational establishments proper. When a man's qualifications had been taken to a final stage there, a further period of practical training and experience in his profession was necessary. That must be the responsibility of the appropriate professional organisation.

The Institute had to keep in mind the requirements of a wide field. The significance was emerging more and more clearly of a circumstance, remarked recently by Lord Charwell, that the number and variety of professions had so increased during the last century that today probably the majority of educated men were employed in so-called technical activities. It was, therefore, most gratifying to welcome so strong a representation betokening the interest of educational as well as professional life.

Coupling with the toast the name of Sir Harold Brown, the President said he had become Chairman of the Fuel Research Board in 1947, continuing a distinguished career in which he had served as Engineer-in-Chief of the Fleet. In that position he could not but be deeply concerned with fuel questions, a concern which in varying measure he had pursued through his various distinguished appointments at the War Office and in the Ministry of Supply, and had continued in his Chairmanship of the Fuel Research Board, responsible as that organisation was for so great a range and volume of work on the development of which further advances in fuel technology must depend.

Engineer Vice-Admiral Sir **Harold Brown,** G.B.E., K.C.B., (Chairman of the Fuel Research Board) responded. In his work in connection with the Fuel Research Board, he said, he had been honoured by the support of many members of the Institute, to whom he was glad to be able to convey his gratitude. Speaking of the duties of that Board—about which he knew there was some doubt—he said it was, apart from the over-riding consideration to be of maximum use to the community, to advise on the research work of the D.S.I.R. organisation which was carried out at the Fuel Research Station, assisted by various extra-mural bodies—the universities, and so on. A matter about which there had been considerable doubt in some people's minds was the future of that organisation vis-a-vis the Ministry of Fuel and Power and the research organisations of the nationalised industries when they were set up. It had been laid down by the Advisory Scientific Council some years ago that the D.S.I.R. organisation should retain the prerogative to initiate research on fuel, as on other problems of that kind and, therefore, they should retain their responsibility for the fuel research organisation of the D.S.I.R., who, however, would undertake work for the Minister of Fuel and Power, the Service departments, and the Ministry of Supply. That was fairly well established now. In regard to the possibility of overlapping, duplication of effort, with the research organisations of the nationalised industries, certainly it should be no more difficult, and probably it would be easier to prevent duplication now than was the case previously, bearing in mind also that it had been laid down officially that the Minister of Fuel and Power, through the Advisory Council, had the duty of watching the various organisations to prevent unnecessary duplication and to see that there were no gaps in the work.

Unofficial Co-ordination

He was very happy to say that very close and intimate relations had been established unofficially between the D.S.I.R. organisation and the organisations of the nationalised bodies, and he felt sure those very happy unofficial relations would be maintained, to the mutual benefit of everyone. He hoped that with that co-ordination they would be able to avoid the curse of departmentalism and the waste of scientific man-power, which waste the country could not afford. A further advantage was that it left the D.S.I.R. organisation free to study the more fundamental or basic problems concerning the burning of fuel of all kinds, the chemistry of coals, and problems which, although they might not be of immediate interest to this country, were of vast interest to the Dominions. Indeed, Sir Harold

(*Continued on p. 375*)

Institution's New Headquarters Opened

Successful Culmination of Two Years' Efforts

THE new headquarters of the Institution of Gas Engineers at 17, Grosvenor Crescent, a few yards away from Gas Industry House, its home for the past 13 years, were officially opened on May 4 in the presence of a representative gathering of members of the Gas Council, the Institution, and the Society of British Gas Industries. Both the Minister of Fuel and Power, Mr. P. J. Noel-Baker, and the Parliamentary Secretary of the Ministry, Mr. Alfred Robens, had a part in the ceremony, which was presided over by Mr. C. H. Chester, O.B.E., President of the Institution. Detained at an important Cabinet meeting, the Minister had deputed Mr. Robens to perform a duty which he had himself been invited to discharge, and a few moments before Mr. Robens had finished speaking. Mr. Noel-Baker arrived and added a few words of good wishes.

Mr. Robens said it was a proud day for the Institution, for the official opening of the new headquarters had a historical as well as professional significance. The premises had been devoted to public service for half a century, for some 30 years before the Institution received its Royal Charter the house was acquired by two ladies who ran it as a hospital for the wounded in the South African war. He had no doubt that under its new ownership it would serve the great interests of the Institution in the second half of the century no less effectively than it had served the public interest in the first half.

The Institution had a great tradition and had reason to be proud of its long history and of the many eminent men who had been associated with it. Although it was not actually founded until 1863 it was clear that gas engineers were for at least a decade before that time concerned about the formation of such an organisation.

Our national prosperity depended on the efficient use of our fuel and power resources and the growing application of new scientific ideas and techniques in the gas industry—a vital partner in the fuel and power group, and in those matters the Institution of Gas Engineers fulfilled a very important rôle. The industry demanded a scientific approach and whatever the results of research it would be for members of the Institution to see that they were applied in the gas industry.

Great Men of Vision

He had been impressed with the Institution's work in the cause of education and more recently in the important part it played in the affairs of the International Gas Union. He paid tribute to the leaders of the industry and of the Institution among whom he had made many friends since taking up his present job, which he was reminded was only a temporary one. He did not doubt that under the Presidency of Mr. Chester the Institution would go from strength to strength, and in formally opening the new premises he offered his heartfelt wishes for the lasting prosperity of the Institution. He hoped that there would pass through the portals of that building great men of vision, courage, and enterprise who would always give first place to their service in the interests of the industry and the public which it served.

Mr. P. J. Noel-Baker, on his arrival, offered warm congratulations on the new building and expressed the hope that the Institution's future would be even more successful than its past. The great changes which had taken place in the industry in the past year had not made any less important the work that the members of the Institution did; rather had they added to their importance. The nation was beginning to recognise the importance of the scientific use of our fuel and power resources to the economic and political greatness of the country. Members of the Institution had a great part to play, and he was sure they would play it.

Mr. C. H. Chester, in thanking the Minister and the Parliamentary Secretary for their kindness in participating in the ceremony, said it was almost exactly 100 years since the formation of the Institution was first mooted, simultaneously with the erection of what was destined to become the headquarters of the Institution. Mr. Chester also welcomed Sir Donald Fergusson and Mr. R. Kelf Cohen who, a few years ago, at the instigation of Colonel H. C. Smith, then Chairman of the British Gas Council, told them they thought the Institution should have headquarters of its own, of which the members might be proud. The industry responded magnificently to the appeal for funds to realise that ambition and sufficient money was raised to buy the lease of the present building and to provide an endowment sufficient to renew the lease when it fell due.

Harmony in the Industry

'We felt the dignity of the Institution would be enhanced,' said Mr. Chester, 'if the atmosphere in the building was one of purity and charm, divorced from No. 1, Grosvenor Place.' Joking apart, he paid tribute to the sincerity of purpose which existed within the Gas Council, with its keenness to provide gas at the lowest possible price and to render a service which the public would appreciate. It was the aim of the Institution to look after not only the efficiency but also the happiness of those who served the industry. On the other hand Sir Edgar Sylvester had the duty of keeping 12 area board chairmen, and sometimes the Deputy Chairman of the Gas Council, in order. His was no light burden and shortly after vesting day last year he gave, at the annual meeting of the Institution, a wonderful address which would long be remembered as an inspiration to the members to continue the great traditions of the Institution. Concluding, he presented Mr. Noel-Baker with a specially bound copy of the brochure relating to the day's proceedings.

Sir Edgar Sylvester said he admired the new headquarters and wished the Council and members the best of fortune in the future. He assured them that there was no kind of divorce between the Gas

Council and the Institution, a statement supported by the fact that while the Institution could, if it had chosen, have moved miles away, chose to find a new home as near to Gas Industry House as possible. The fact that the Institution had a separate building meant that their activities could be carried on in complete independence and yet with an ever greater idea of unity between the Gas Council and the area boards who were responsible for running the industry on the one hand, and the Institution on the other, whose function was to represent and help its members in the technical aspects of their careers.

The Gas Council contemplated using the services of the Institution to a far greater degree in the future than had been possible in the past, and its members were delighted that the members of the Institution were prepared to help them in every possible way. The arrangements for the new headquarters were initiated during the Presidency of Dr. Harold Hartley, who was the mainspring and principal instigator in the whole movement. On behalf of the Council of the Institution he presented him with a cigarette casket as a memento of the occasion.

At this stage the President presented bound copies of the opening ceremony brochure to Sir Edgar Sylvester and Colonel H. C. Smith.

Dr. Hartley, in acknowledgment, recalled that it took 14 years to form the original Institution, whereas it had taken only two years to complete the headquarters scheme. In 1948 Colonel Smith told them that if the Gas Act was passed it was not improbable that the Institution would have to find fresh accommodation, and they promptly got to work, with the results which were now evident. It had been arranged to spend 50% of the money raised by the appeal on the acquisition of the building, and with the remainder to provide an endowment to ensure that the Institution had its own headquarters in perpetuity. Much of the success of the effort was due to the untiring energy of Dr. W. T. K. Braunholtz, Secretary of the Institution, who had handled the negotiations for acquiring the house with the greatest of tact. He also wished to acknowledge the great help rendered by Mr. F. M. Birks in regard to the furnishing of the premises.

At the close of the ceremony the visitors were entertained to light refreshments and made an inspection of the building.

The opening ceremony. Our photograph shows (left to right): Mr. A. Robens, M.P., Parliamentary Secretary to the Minister of Fuel and Power, Mr. P. J. Noel-Baker, Minister of Fuel and Power, Mr. C. H. Chester, President of the Institution of Gas Engineers, and Sir Edgar Sylvester, Chairman of the Gas Council.

The Council Chamber

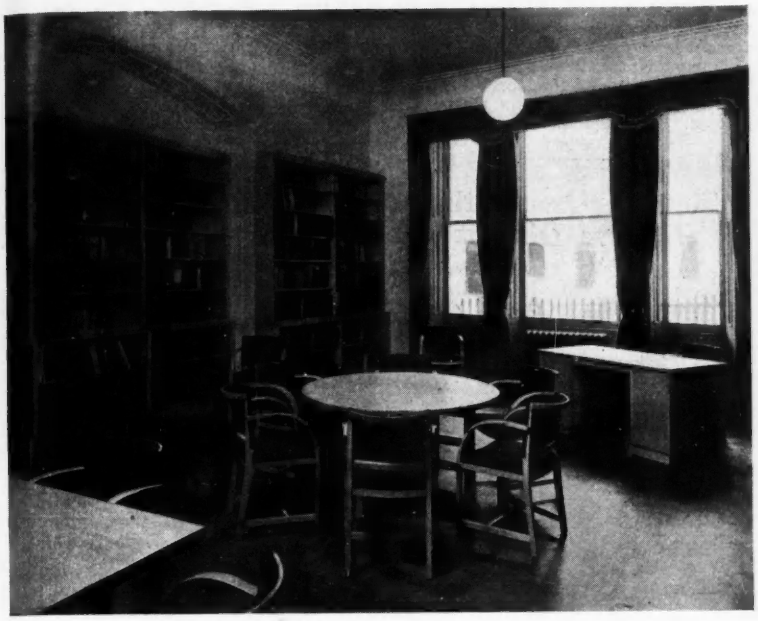
The New Headquarters

In the early days of the British Association of Gas Managers and of the Gas Institute the business of the organisation was conducted from the business address of the Secretary in office. When the Gas Institute was incorporated, in 1890, its registered address was at 3, Victoria Street, S.W.1. In the same year the Incorporated Institution of Gas Engineers had an office at 11, Victoria Street. Later addresses at which the Institution rented office accommodation were 13 and 39, Victoria Street. In 1919, temporary accommodation was found in the Monck Street offices of the Gas Light and Coke Company.

For many years, from 1919 onwards, the Institution shared offices with other national gas organisations, first, at 28, Grosvenor Gardens, S.W.1, and for the last 13 years at Gas Industry House. The view had, however, frequently been expressed, and it was the unanimous opinion of the Council, that the Institution ought to be housed in appropriate headquarters of its own.

The provision of the capital sum required to acquire suitable premises in London was quite beyond the immediate means of the Institution, and it was therefore necessary to launch a special appeal for funds for this purpose. The Council appointed a strong House Appeal Committee under the chairmanship of the President in office, Dr. Harold Hartley, and towards the end of May, 1948, this committee issued letters of appeal, having an ultimate target of £100,000, to all Institution members, to gas undertakings and to member firms of the Society of British Gas Industries. The Minister of Fuel and Power gave invaluable support to the project by allowing gas undertakings, in spite of impending nationalisation, to contribute to the fund at a stated maximum rate.

The interest in the project was strikingly shown by the receipt of promises from 60 members of the Institution, who



The Library

were privately approached before the appeal was launched, to contribute £4,000 to the fund. In all, promises totalling £60,000 were eventually received before the public appeal was issued.

The response to the appeal itself was most gratifying and resulted in a total of £112,000 being contributed as follows:

Institution members	£11,000
Gas undertakings	£75,000
Member firms of the Society of British Gas Industries ...	£26,000

The duty of acquiring a house was entrusted to a House Appeal Executive Committee. Very suitable premises, 17, Grosvenor Crescent, which had been bomb-damaged in 1941, were eventually found within 100 yards of Gas Industry House, and the 50 years' lease of this, after restoration by the owner, was purchased by the Institution. Apart from its office equipment, the Institution possessed little furniture, and it had to equip its new Council and committee rooms, library and reading room, members' room and other rooms with new furnishings and furniture. The purchase of the house and its equipment have cost a sum equal to about one-half of the total amount collected, and the other half is being used to establish a sinking fund to enable the Institution eventually to renew the lease.

Imposing Aspect

The house has an imposing aspect, with its principal rooms facing south and west. There are four floors above the ground floor, and a basement, the rooms on each floor being conveniently arranged round a wide central staircase and a lift serving the basement and all floors. There is central heating throughout, supplemented in many rooms by gas fires and by an open coke fire in the members' room. The total floor space, excluding basement, landings, cloakrooms, &c., is about 7,000 sq. ft. The house is exceptionally light and airy throughout. The accommodation is arranged as follows:

Ground Floor: Entrance hall, main hall, library, reading room, visitors' waiting room, store room (or office).

Intermediate Floor: Members' room.

First Floor: Council room and anteroom, large committee room, small committee room, main cloakrooms.

Second Floor: Secretary's office, general office, two smaller offices.

Third Floor: Education and editorial offices, two smaller offices, President's flat (private sitting-room, bedroom, bathroom and lavatory).

Fourth Floor: Staff rest room, caretaker's flat (sitting-room, bedroom, kitchen, bathroom and lavatory).

Basement: Machine room, staff canteen, kitchen, scullery, two store rooms and boiler house (gas-fired central heating and hot water boilers).

The Council room can accommodate a committee of up to about 45 persons, or, with tables removed, an audience of about 80. The small committee room adjoining it can be opened into it by large folding doors, and it is estimated that together they can seat an audience (without tables) of about 120. The larger committee room will accommodate comfortably a committee of 31. A small piece of land at the south side of the house has been converted into a formal garden.

The Consulting Architect for the furniture and furnishings of the house was Mr. Robert Bostock, M.A., L.R.I.B.A., of Unsworth and Bostock, Architects, London. The Consulting Surveyor was Mr. P. J. Mills, A.R.I.C.S., F.A.I., of Harold Williams and Partners, London.

The greater part of the new furniture and furnishings was specially made by Heals Contracts Ltd., London.

Historical Note

According to information supplied by Sir George D. Ogilvie, K.C.I.E., C.S.I., C.I.E., House Governor of King Edward VII's Hospital for Officers, by Mr. Geoffrey Singer, F.R.I.C.S., A.A.I., Surveyor to the Grosvenor Estate, and by Mr. Robert Bostock, M.A., L.R.I.B.A., the earliest record of 17, Grosvenor Crescent, is that it was leased to a Mr. Thomas Cubitt, who was probably the builder, from Lady Day, 1849, for a term of 75 years. (It is interesting to note that it was in the same year, 1849, that suggestions were first published for the formation of an Institution of Gas Engineers). The lease was assigned to a Mr. Ramsden on October 26, 1904, then to the Earl of Cranbrook on April

Members' Room

19, 1912, and a reversionary lease, dated October 31, 1918, was granted to Miss Agnes Keyser from Lady Day, 1924, to Midsummer, 1949. This was disclaimed on January 27, 1941, owing to war damage.

In the nineties of last century, two sisters, Miss Agnes and Miss Fanny Keyser, lived at 17, Grosvenor Crescent, and were well known in London and on the Continent. They kept open house and had hosts of friends, and they were honoured by the friendship of the Prince of Wales and the Duke of Connaught, whom they entertained in their house.

When the South African War broke out in 1899, Miss Agnes Keyser asked the Prince what she could do to help, and he suggested that she should open a hospital in her own house to nurse officers sick and wounded in the war. She accordingly offered her house for this purpose, and the hospital was opened a short time later, in December, 1899. The Prince of Wales became much interested in the hospital and himself constantly visited the patients.

At the end of the war the Prince, who had then succeeded as King Edward VII, said: 'This hospital must not close, as there is such a need in time of peace for officers who serve in so many climates all over the Dominions.' The hospital, therefore, remained open, but as there were not enough beds available at 17, Grosvenor Crescent, it was moved to 9, Grosvenor Gardens, where it was formally opened by King Edward VII on April 23, 1904. The hospital remained at 9, Grosvenor Gardens, for 15 years.

In 1919, Miss Agnes Keyser and her sister moved into 16, Grovenor Crescent, and the hospital was brought back to 17, Grosvenor Crescent, where King George V and Queen Mary formally opened it on June 12, 1919.

When war broke out in 1939, the hospital was kept open at 17, Grosvenor Crescent, until the night bombing started in September, 1940; it was then temporarily closed, but at 7.30 p.m. on January 11, 1941, a high explosive bomb fell within a few yards and completely wrecked the interior of the house. Sister Agnes died four months later. After the war, the hospital was reopened by Queen Mary, on October 15, 1948, at Beaumont House, Beaumont Street, W.1. Up to the date of the death of Sister Agnes, some 12,000 officers had passed through the hospital.

Southern Association (Eastern District)

The final meeting of the Session of the Southern Association of Gas Engineers and Managers (Eastern District) was held at Gas Industry House, on April 25. The chair was taken by Lieut.-Col. J. A. Gould (Chairman of the District).

The Chairman said they had heard officially that the application to be incorporated as a District Section of the Institution of Gas Engineers had been accepted. He added that the following had been recommended to the Institution as the first officers of the Management Committee of the new London and Southern Section:

Chairman: Mr. T. C. Battersby.

Immediate Past-Chairman: Col. J. A. Gould.

Senior Vice-Chairman: Dr. A. E. Haffner.

Junior Vice-Chairman: Major C. R. M. Croft.

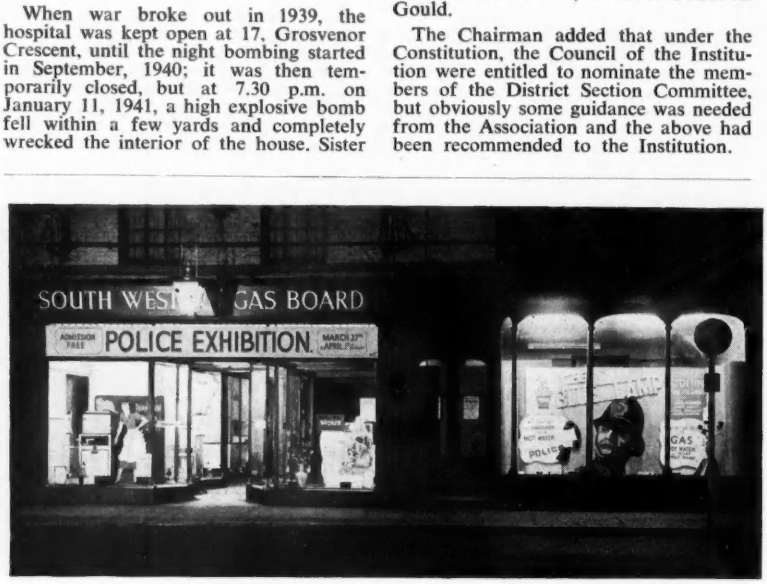
Hon. Auditors: Mr. H. A. Probyn and Mr. C. F. Botley.

Hon. Secretary and Hon Treasurer: Mr. J. M. Webber.

Management Committee: Messrs. W. A. Barnett; D. B. Parkinson; Dr. S. Pexton; H. Bradley; E. O. Rose; S. W. Hammond; A. Tran; A. J. Brunis, and J. H. Hornby.

District Member of Council: Col. J. A. Gould.

The Chairman added that under the Constitution, the Council of the Institution were entitled to nominate the members of the District Section Committee, but obviously some guidance was needed from the Association and the above had been recommended to the Institution.



The local police entered Taunton's gas showrooms last month when an enterprising exhibition was staged to coincide with the film about police work, 'The Blue Lamp.' Officially opened by the Mayor of Taunton, the exhibition attracted queues of people to have their fingerprints taken, to hear messages from radio-cars, and to see other exhibits.

The Building Centre

THE Building Centre was in the news in a big way a few months ago with the re-opening of the Gas Council's Section, which has attracted much attention and is being used more than ever before. Since then a gas industry event at the Centre has been the cooking of enormous quantities of small sausages in a demonstration of infra-red gas cooking.

But the Building Centre, to quote its own pamphlet, is a constantly changing permanent exhibition of everything relating to building, and that includes the smallest cottage and the largest factory and public buildings. The Building Centre answers enquiries about them all. The constant changes to be seen in the Centre make it interesting and fresh; in fact, it is its constant change which makes it permanent.

Some recent changes may be mentioned. The Rural Industries Bureau has just put in a collection of hand-made bricks, which shows clearly that even in so hard a material as baked clay, handwork produces a sense of quality not to be found in mass production. Some of these bricks come from yards with an annual output of only a few thousand bricks. All the bricks made by the 40 or 50 brickyards represented are probably less than those made by any one of the biggest yards in the country. The Rural Industries Bureau fosters small scale craftsmen of all sorts all over the country, and sponsored the recent exhibition of hand-made furniture at the Victoria and Albert Museum.

Another new exhibit is that of the Timber Development Association. Here, gathered together, possibly for the first time, are samples of all the new African timbers introduced to this country since the war, as well as samples of the older woods. There are about 250 samples shown as well as illustrations and models of modern techniques in laminated and other timber structures.

The first floor has been entirely reorganised and the layout opened up. On this floor an exhibit has been installed illustrating the work of the Building Research Station and the Forest Products Research Laboratory. The Ministry of Works has installed a new exhibit dealing with pre-stressed concrete.

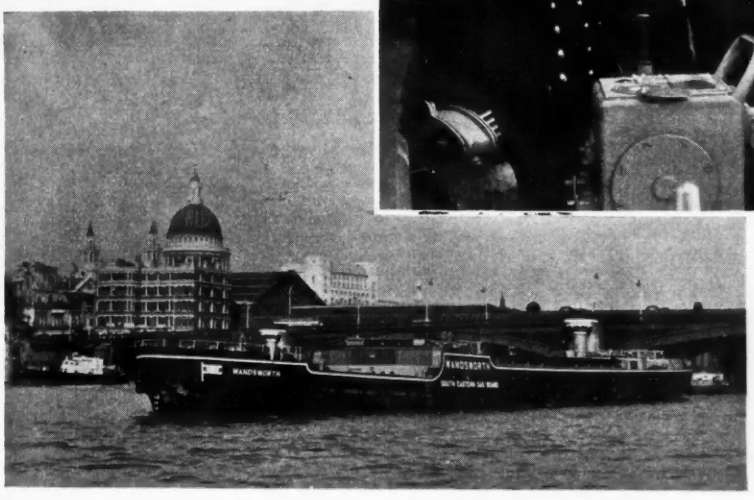
We have mentioned only new exhibits by Government departments and various organisations but, of course, the bulk of the Building Centre consists of exhibits by individual manufacturers. There is a number of new specimen floors, and it is specially interesting to see the great range of colours of the new plastic tiles. There is a 16 ft. pre-stressed concrete beam, set on end, towering up to the ceiling of one room on the ground floor. In the same room is a light alloy roof truss with a span of 20 ft., which can easily be carried by one man. A decorative coloured mosaic on a wall of the main staircase is another new exhibit.

The Building Centre seems to answer questions about everything to do with building. Questions are so numerous that only those which deal with actual exhibits are recorded. In 1949 these were between 125,000 and 150,000, and in the first three months of 1950 over 50,000. Many of these, of course, relate to the Gas Council's exhibit, where Mr. P. C. Buckle has been in charge since the Section was opened in 1933.

Maiden Voyage of the 'Wandsworth'

Largest Ship Up the Thames Beyond London Bridge

THE commissioning of the South Eastern Gas Board's single screw diesel engined collier *Wandsworth* has marked a further stage in the development of this type of sea-going vessel. The first ship to deliver coals to Wandsworth gasworks (although not built specially for trading to Wandsworth) was the s.s. *Ratcliff* in 1906, the tonnage carried being 1,050 tons. The *Wandsworth* carries a cargo of approximately 2,800 tons. The length of the former ship was 170 ft. and her breadth 36 ft. compared with the latest arrival with a length of 275 ft. and a breadth of 39 ft. 6 in.



On the bridge. Left to right: Captain L. J. Georgeson; the Mayoress and Mayor of Wandsworth (Alderman A. E. Carr); Mrs. W. K. Hutchison and Mr. W. K. Hutchison, Chairman, South Eastern Gas Board.

Left: The 'Wandsworth' passes up river with Blackfriars Bridge in the background.

Built by the Burntisland Shipbuilding Co., Ltd., Scotland, the *Wandsworth* is designed for the transport of gas coal from ports on the North East Coast to discharging berths of the South Eastern Gas Board.

Special consideration has been given to accommodation for the ship's personnel, single berth cabins being arranged throughout for the officers and crew. A cooker and a refrigerator, operated by Calor gas, are installed amidships and an oil-fired range fitted aft. Central heating is provided by means of oil burning apparatus and electric lighting is installed throughout the ship. Mess-rooms and shower baths, oilskin lockers and drying rooms all add to the comfort of the men.

On the maiden voyage through the Thames Bridges on April 23, the ship's company was joined by the Chairman to the board (Mr. W. K. Hutchison) and the Deputy Chairman (Mr. R. S. Johnson), accompanied by Colonel C. M. Croft; Mr. L. E. Ford, General Manager of the Port of London Authority; Commander A. M. Coleman, Chief Harbour Master and River Superintendent; Mr. R. B. Weallans, Director of the Burntisland Shipbuilding Co., Ltd. (representing Sir Wilfrid Ayre); Major E. C. Hatcher and Mr. S. McAlister, of Stone & Co. (manufacturers of the propeller) and Mr. S. E. Beck, Marine Artist. The board's Coal and Shipping Manager, Mr. A. G. Gostelow, Marine Superintendent, Mr. Roy Wilson, and Mr. H. F. Buxton were also present.

On arrival at the Wandsworth gasworks, the ship was greeted by the Mayor and Mayoress of Wandsworth (Alderman A. E. Carr, J.P., and Mrs. Carr) and Mrs. W. K. Hutchison, wife of the Chairman of the board, who, with other visitors, including Councillor Mrs. C. M. Croft boarded the ship and made a tour of inspection before returning to the office where some of the party had been received and entertained at tea earlier in the afternoon by Mr. R. M. Farror (Engineer, West Surrey Division) and Mrs. Farror.

FUEL RESEARCH BOARD — continued from p. 370

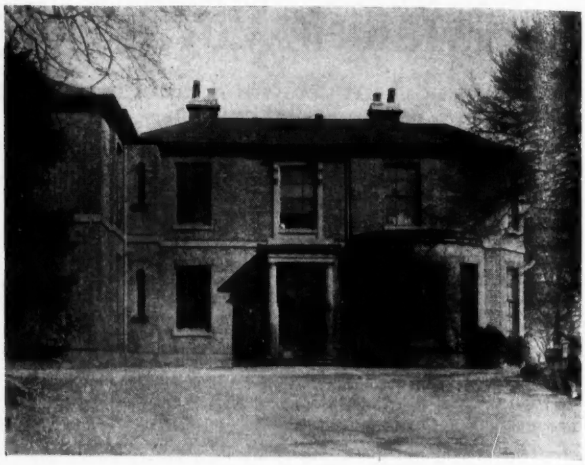
considered that the decisions arrived at were very wise. It was extremely desirable, in the interests of this country as a whole and of the Dominions overseas, that there should be a body of that description which was free of any sectional interests and which could advise of such problems.

Replying to the criticism which had been made that the D.S.I.R. organisation had not carried out sufficient fundamental or basic work, Sir Harold pointed out that during the war and post-war periods the stress had been on immediate problems; but now the position would gradually right itself. He felt that the expression 'fundamental work' was not always fully understood. It did not mean purely laboratory work; it meant taking work up to a stage at which it ceased to have an immediate effect on design.

The Institute of Fuel was a vital link in the chain, not only since it provided members of the Fuel Research Board and of other research bodies, but had great contacts with the professional side of the industry, which was so essential if its work was to be kept alive. The Board appreciated very much the help given by the Institute's members, and he was glad that the officers of the Fuel Research Station contributed to the proceedings of the Institute with, he hoped, advantage to the public, to the Institute, and to themselves. The Institute fulfilled two great functions. One was to ensure the wide dissemination of knowledge on fuel questions which was so essential in ensuring that our fuel resources were used to maximum efficiency; the other was to see that in Membership and Fellowship of the Institute there was provided a balance of technical efficiency, not only by avoiding too early specialisation, but by insisting on a really good academic background, backed up by real experience in the work.

COKE RESEARCH DEVELOPMENT

ON Thursday last the Earl of Halifax formally inaugurated the Midland Coke Research Station of the British Coke Research Association at Sheffield, when we had the opportunity of inspecting the work in progress at the station ('Lynwood,' Clarkehouse Road). The occasion was marked by a smoothness for which highly efficient organisation was responsible. Many distinguished in the spheres of Government, education, science, and fuel technology were present and the company was afterwards entertained at luncheon by the Association at the Royal Victoria Station Hotel, the chair at this function being taken by Mr. F. Scopes, Chairman of the British Coking Industry Association.



The Midland Coke Research Station, 'Lynwood,' Sheffield.

Before we describe the new premises it will, we feel sure, be useful if we set out briefly the history of B.C.R.A. The Association was formed in 1943 and was incorporated in June, 1944, in which year a most enthusiastic conference was held at the University of Leeds, when the Association had an excellent 'send off.' The Association was formed under the aegis of the British Hard Coke Association with the support of the Department of Industrial and Scientific Research. By no means, however, did it start *de novo*. The Midland Coke Research Committee was set up in 1926 and was followed shortly afterwards by the formation of the Northern Coke Research Committee, and there was also a Scottish Committee. Since their inception we have followed the work of these bodies, undertaken at Sheffield, Newcastle, and Glasgow, with great interest, as indeed, the pages of the *Journal* testify. With the incorporation of the Association the financing of the work was undertaken by the British Coking Industry Association, and centralised control and co-ordination of research activities on coke became the responsibility of the Council of B.C.R.A., whose headquarters are in London. Wisely, it was decided to continue the research establishments at Sheffield and Newcastle and to promote work in Glasgow on problems of particular interest to that area.

The Midland Committee was housed in the University of Sheffield until 1946, when it became part of B.C.R.A.; and in that year it was decided to establish the Midland Coke Research Station. The Association approached the Sheffield Corporation in its quest for suitable premises, and the Corporation, which has always been keenly concerned in furthering matters affecting the interests of the basic industries centred in and around Sheffield, agreed to grant the Association a lease of a detached house owned by the Corporation and known as 'Lynwood,' situated in its own grounds. 'Lynwood' is in Clarkehouse Road, Sheffield, 10, about one mile from the centre of the city and conveniently situated in regard to both the main University buildings and the Department of Fuel Technology in St. George's Square. The situation, facilities, and amenities render the station very suitable for the type of work the Association is undertaking in Sheffield.

The New Premises

The premises naturally required some adaptation for the purposes of research and this work was undertaken without delay. By the end of 1948 most of the structural alterations had been completed and a start was made in equipping the buildings for research. On the first floor chemical and physical research laboratories were set up, together with a balance room, calorimetry room and chemical store. A general analytical laboratory was also established on this floor. On the ground floor are situated the Superintendent's office and staff rooms, the general office, and the library. In this latter connection, arrangements were made with the Coke Oven Managers' Association whereby the library of this Association was transferred to the Midland Coke Research Station and became the property of B.C.R.A., while being freely available to all *bona fide* members of the industry. On the ground floor also are coke stores and a boiler test house. A photographic department has been established in the basement, together with stores and an electrical workshop.

The various outbuildings have been converted into use as laboratories for various purposes including sample grinding and a workshop. A laboratory has been provided for testing coke burning appliances and this has been equipped with the means for carrying out efficiency and other tests on open grates, stoves, domestic hot water boilers, and small central heating installations.

The sampling and grinding arrangements available at the station probably constitute the most efficient means yet devised for obtaining representative samples of finely ground coke from bulk consignments for purposes of analysis.

Though we are dealing here more specifically with the Midland Coke Research we will mention the Association's 'panel system.' Before doing so, however, we will make the picture of the Association's organisation a little more complete by recording that the Northern Coke Research Committee was established at Armstrong College (now King's College, University of Durham) and the work developed parallel to that of the Sheffield laboratory. In 1944, the Committee became a recognised Advisory Committee to King's College, and since that time its work has been financed by B.C.R.A. An agreement was concluded in 1945, between King's College and the Association, whereby the College undertook to maintain staff and laboratory facilities for the purpose of carrying out agreed research on coke by means of funds provided by the Association. In recent years the work of the laboratory has been particularly concerned with research into the fundamental nature of coal and coke by detailed studies of the X-ray diffraction broadening which occurs in the powder photographs of coal, cokes, and chars. The Committee is now engaged in the examination of the magnetic susceptibilities of coke, work on solvent treatment, and the important problems of sulphur in coke.

The Panel System

On the formation of B.C.R.A. it was agreed that, in order to secure closer co-operation between the regional research workers and to obtain more intimate liaison with the operating technicians of the industry, a system of panels should be set up to deal with certain specific items in the programme of research and that the panels should consist of members drawn from both these sources. This system has proved to work efficiently in practice and though it was rather in the nature of an innovation at the time it was adopted has proved to be of the greatest value both to the research workers and to the operating technicians of the industry. Ten panels have now been nominated. In their formation the Association has drawn widely from the personnel serving the coking industry and other industries which it serves. The work of the panels is carried out partly at coking plants by the technicians represented on the panels and partly in the research laboratories at Sheffield, Newcastle, and Glasgow.

This novel system of forwarding research work was a challenge to those

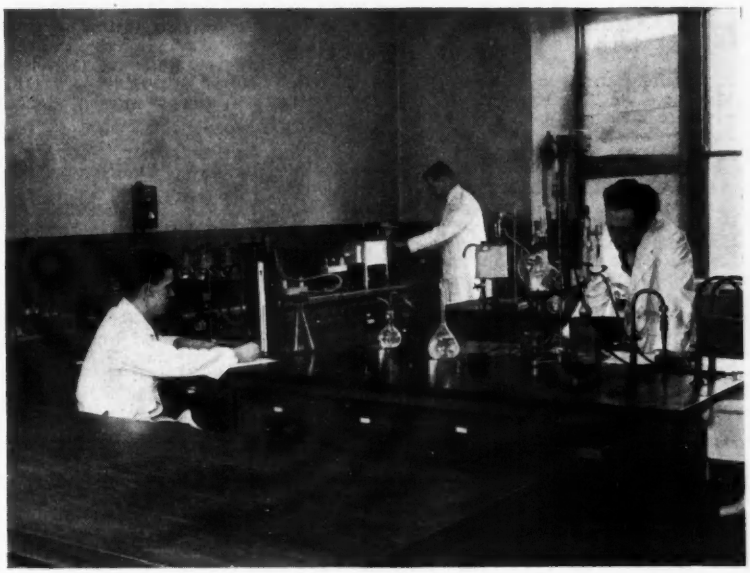
actively engaged in the industry to co-operate in investigations the value of which could be subjected immediately to plant scale trial and criticism. The results achieved have amply justified the belief of Council that the technicians of the industry desired to co-operate in the research work of the Association. The stimulus to thought and the quicker appreciation of the results of research work fostered by the system are of great value to the industry.

Work in Progress

In the following we give a few notes on the work which is currently being undertaken by eight of the ten panels.

Panel No. 1 is concerned with the standardisation of sampling, analysis, and testing in the industry. The practical research work for this panel is carried out at the Midland Coke Research Station and at the laboratories attached to the plants of members of the panel. Methods have been published for the testing of coal for coke making, the rapid determination of the forms of sulphur in coal, and for the float and sink analysis of coal. Work has also been carried out on the rapid determination of chlorine in coal, the rapid determination of phosphorus in coal, and on methods for the sampling of coke. A special feature of this work has been the reduction of the time required to make tests of importance to the industry without sacrifice of accuracy. It is hoped that many of these tests will be incorporated in British or even International Standards.

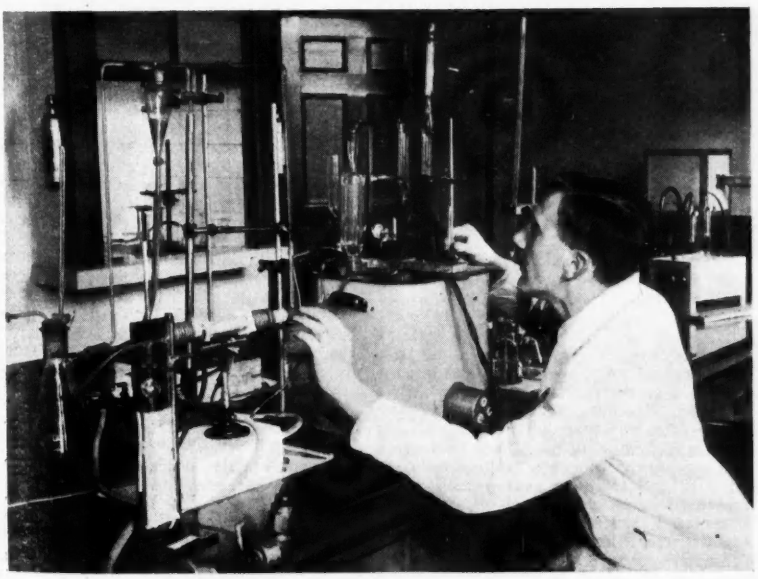
Panel No. 2 is studying the specification of uniform methods of determining and reporting yields of coke and by-products from a defined coal. Investigations have already been carried out on the examination of coke yields. The panel stresses that adequate weighing and measuring appliances should be incorporated as essential equipment on a coking plant, but has drawn up an inferential method suitable for estimating coke yield where direct weighing facilities are not available. The panel is now considering methods of specifying yields of by-products.



Work on behalf of No. 1 Panel being carried out in the Chemical Laboratory at the Midland Coke Research Station.

Panel No. 3 comprises the specification of coke sizes and the determination of the most suitable sizes for specific purposes. An improved type of multi-deck mechanical test screen has been designed, built, and tested, and quantity production is now being considered with a view to the adoption of this apparatus on coke oven plant as a standard piece of testing equipment. The panel is also engaged in developing new outlets for coke breeze and has issued a report dealing with the production, properties, and use of coke breeze from coking plants.

Panel No. 4 has been concerned with the relationship between coal quality, oven width, flue temperature, and capacity for making coke of suitable quality. Co-operative work has been done in relating these factors so that suitable coal carbonising capacities can be specified for different qualities of coal. A report on this subject has been issued showing that, contrary to general belief, oven width has very little effect upon coke quality and that the governing factor is the quality of the coal fed to the oven. These conclusions relate particularly to blast furnace coke production. Further work is obviously desirable in connection with the production of domestic coke.



Coke Testing: Determination of Sulphur.

Panel No. 6 deals with practical plant problems. Problems examined so far relate to the design of ends of ovens with special reference to the cause of distortion of buckstays, protection frames, or flashplates; the rapid deterioration of jamb brickwork which has been experienced by many batteries of silica ovens in recent years; improvements in design to eliminate or reduce smoke emission from batteries; to reduce the necessity for exposure of plant personnel to high temperatures and to give in general a better standard of working conditions. The panel is proceeding to study the problem of improving the heat insulation of batteries, including the use of refractory and insulating concrete as a material of construction.

Panel No. 8 concentrates on the process of blending. A study has been made of the possibilities of the utilisation of fuels other than coking coals, such as coke breeze, anthracite duff, pitch, and open-cast coal, for the manufacture of coke in coke ovens. The economic aspect of blending breeze with the coke oven charge has received particular attention and reports have been

published on this work. The panel has recently undertaken work at the Thorncliffe coking plant near Sheffield on the blending of coals by means of a small test oven of the type developed by the Midland Coke Research Committee. The experimental work for this project is being carried out by members of the staff of the Midland Coke Research Station.

Panel No. 9 is concerned with the influence of chemical and physical properties of coke on blast furnace practice. Collaboration with the British Iron and Steel Research Association has been maintained by making Panel No. 9 a joint panel responsible to both the Research Committee of B.C.R.A. and to the iron-making divisional panel of the British Iron and Steel Research Association. The panel is sponsoring research work at the Royal Technical College, Glasgow.

Panel No. 10 deals with the problems associated with the production and utilisation of foundry coke. The British Cast Iron Research Association is collaborating in this work.

Finally we would refer to the Pontypridd test plant committee set up by the Association in 1945 to control a programme of work dealing with the swelling pressures exerted by coals during carbonisation. A movable-wall test oven was erected for this purpose at the Maritime Coking Plant at Pontypridd, South Wales, and a comprehensive survey of the swelling pressures developed by British coals during carbonisation was then carried out. The results were considered at a conference of the Association held in the Royal Institution on December 15, 1948. Further research is being undertaken on the control of pressure development by blending, the effects of variation of coking rate, the measurement of internal gas pressures, the correlation of test oven results with actual practice, and the investigation of fundamental relationships. The movable-wall oven for this investigation is the only one of its kind in Europe.

A Proud Record

The visit to 'Lynwood' was followed by a luncheon at the Royal Victoria Station Hotel, Mr. **F. Scopes** (Member of Council of the British Coke Research Association, Chairman of the British Coking Industry Association), presiding.

Dr. **W. Idris Jones** (Member of Council, B.C.R.A., Director General of Research, National Coal Board) proposed the toast of 'The City of Sheffield,' in doing so saying it was the aim of the B.C.R.A. to play its part in the composite activities of the industrial community of Sheffield, which superficially might not by many to be considered attractive, had bred and nurtured men who had bent to their will the natural resources of the area. Nor should it be thought that Sheffield was just industrial, merely smoke and grime and hard manual toil. It had a proud record of local government, of encouragement of education and the arts, of solid and at the same time enlightened service.

The Lord Mayor of Sheffield (Alderman Mrs. Grace Tebbutt), who had visited the Research Station during the morning, replied. Her speech was devoted rightly to the enterprise of Sheffield —a city enjoying vast natural resources of raw materials and a plentiful supply of water—in creating industry and material prosperity, the while in no way ignoring the element of beauty in the lives of the individuals comprising an active and imaginative, community.

Mr. **Leslie O'Connor** (Member of Council, B.C.R.A.; Director of Carbonisation, National Coal Board) proposed the toast of 'The Guests,' saying how proud and honoured the Association was to be able to entertain so many highly distinguished in Governmental, educational, scientific, and technological spheres. He made reference to many of those present, including Sir Charles Ellis (Scientific Member, N.C.B.), Sir Hubert Houldsworth (Chairman, East Midlands Division, N.C.B.), Dr. J. H. V. Laverick (Member of Council, University of Sheffield), Mr. T. C. Finlayson (Chairman, Woodall-Duckham Company), and Mr. R. B. Potter (Chairman, Simon-Carves, Ltd.).

Lord Halifax, responding, said that all represented at the gathering had one aim in common—the pursuit of knowledge. He appreciated fully the value of the close relationship of the British Coke Research Association and the University of Sheffield in helping forward the development of the iron and steel and the coal industries. The research work being undertaken so well by B.C.R.A. would benefit urban and rural community alike.

The toast of 'The British Coke Research Association' was proposed by Sir. **Ben Lockspeiser** (Secretary, Department of Scientific and Industrial Research), reply being made by Mr. **F. Scopes.**

News in Brief

Gas Arbitration Tribunal.—The offices of the Gas Arbitration Tribunal, together with those of the Central Valuation Board, the Panel of Arbitrators and the Panel of Referees under the Coal Industry (Nationalisation) Act, 1946, and the Electricity Arbitrations Panel, have been removed to Room 85, Queen Anne's Chambers, Broadway, London, S.W.1. (Tel.: Whitehall 7010, Ext. 105).

Long Service at Nottingham.—Two employees of the East Midlands Gas Board, who together have completed 99 years' service with the Nottingham undertaking, received presentations in the Nottingham gas showrooms on April 20, to mark their retirement. They are Mr. A. E. Wakefield, who is retiring from the position of chief rental clerk after 50 years' service, and Mr. L. Squires, a meter collector since 1918, who joined the undertaking in 1901.

Harrogate Sports Social.—Harrogate Gas Sports Club recently organised a dinner-concert at the Commercial Hotel, Knaresborough, to mark the winning by the team of their division in the League Championship. The President of the Club, Mr. A. McDonald, Member of the North Eastern Gas Board, introduced the League Vice-President, who presented the trophy and mementoes to the players. Mr. McDonald congratulated the players and the committee on the distinction they had achieved in their second year in the League.

Paintworks Fire.—A fire broke out on April 3 at the Cornbrook works, Manchester, of Donald Macpherson and Co., Ltd. This was confined to the top storey of an old building used for the storage of some raw materials and empty containers, and although as a precautionary measure some of the staff were evacuated, production commenced normally after about half an hour. The company reports that no production machinery was affected and there will be no delay in deliveries to customers.

Aberfeldy Renovation.—The Scottish Gas Board has approved the expenditure of £4,000 on renovation work at Aberfeldy gasworks. Sir Andrew Clow announced this when speaking at the opening of a catering and domestic appliance exhibition at Aberfeldy Town Hall, the first show of this type given in Perthshire.

Trade News

Abbott, Birks and Co., Ltd., have published two new leaflets giving details respectively of the new Abbirko ratchet stock and die and the ratchet receding stocks and dies. The first, with a range of $\frac{1}{8}$ in. to 1 in. B.S.P. and $\frac{1}{2}$ in. to $1\frac{1}{4}$ in. conduit, takes the standard accurate easy-cutting square dies, has a die holder of solid steel, and the ratchet, controlled by a reversible hardened steel pawl, enables the stock to be used in confined places and screw the pipe with minimum effort. Advantages claimed for the ratchet receding stocks include accuracy, reliability, and easy screwing.

Babcock and Wilcox, Ltd., have issued under the title of *B & W Advertising* a 24-page collection of their latest two-colour technical advertisements. Printed on art paper with a total page area of $9\frac{3}{4}$ in. by $14\frac{3}{4}$ in. and a printing space of 8 in. by 12 in., the brochure brings together in attractive and convenient form a series of informative advertisements on the meaning of CO_2, the different types of Babcock-Detroit Rotostokers, marine boiler designs, examples of Babcock installations at home and abroad, and illustrations of developments in the fusion welding of pressure vessels at Renfrew. A front cover display announces that the largest Babcock and Wilcox travelling grate stokers in operation are 37 ft. wide by 22 ft. long = 814 sq. ft., 18 of which are installed in or on order for the Vaal generating station, South Africa. Two similar stokers under construction for a Continental power station are 2 ft. longer, giving a grate area of 888 sq. ft.

President's Day for Midland Juniors

Guests of Southern Gas Board at Oxford

FREAK Spring snows having retreated, the sunlit spires of Oxford beckoned to the Midland Junior Gas Association on April 27. The occasion was their President's Day, and many members travelled a considerable distance to visit the Oxford works, of which Mr. S. C. Bentley is Manager, and take part in one of the most successful events in the Association's history.

In his joint capacity as President and host, Mr. Bentley welcomed the visitors on their arrival, and in the hands of competent guides, the party undertook a detailed tour of the works. Oxford gasworks is somewhat unusual in its make-up, spanning the River Thames, and occupying a total area of 19 acres. The original works, built in 1818, were situated on the north bank, and the same site, now extended from two to five acres, comprises what is known as the North Works. Gas manufacture commenced on the south side of the river in 1926, and it was this works, which is spacious and impressive, which occupied the visitors' attention. Carbonising plant, which comprises 320 horizontal retorts, is not particularly modern, but there were many items of interest, including the three units for the production of carburetted water gas from coke, steam, and oil, which are capable of manufacturing up to 50% of the total gas output.

After their inspection of the works the visitors walked through the college precincts to the Forum Restaurant, where they were entertained to lunch at the invitation of the Chairman and members of the Southern Gas Board.

The loyal toast was proposed by Mr. **S. E. Whitehead,** O.B.E, J.P, Deputy Chairman of the Southern Gas Board.

Local Responsibilities

Toasting the Southern Gas Board, Mr. **J. Palser,** Senior Vice-President of the Association, remarked that on the following Monday, like other boards throughout the country, would reach its first birthday. Twelve months ago the Chairman stated that the Board would do everything in their power to maintain the best traditions of the industry and would assist, in every possible way, those prepared to take real responsibility. The area, with 57 acquired undertakings, extended from just beyond Banbury in the north down to and along the south coast from Lyme Regis to the Bognor District and across the water to include the Isle of Wight, making a total of 5,700 sq. miles—an average of 100 sq. miles per undertaking. There were four Divisions based on Oxford, Reading, Bournemouth and Portsmouth. According to published figures there was a population of 2.2 mill. (1939) and an annual output of 21,000.6 mill. cu.ft. With a rather scattered area he understood that the organisation had been definitely designed to avoid centralisation and placed local responsibilities on the local staff. From what he had heard it worked very well, and the area was one of the happiest in the country. The mention of happiness brought him on to a personal note. He was no stranger to the Oxford District, for long before, during and since, the last war, it had been his pleasure to come there on many occasions from Birmingham to deal with industrial problems. These visits were made possible through the arrangements made between various undertakings and the Industrial Gas Centres Organisation, which existed before nationalisation. He always enjoyed working with the local staff and the fullest co-operation of the manufacturers. This had left him with many happy memories. His only regret was that the district was now 'out of bounds' to his own area, the West Midlands, although, strictly speaking, the door was not completely closed. It was possible that work of a special nature could still be arranged between different areas. It was said that from the Chairman downwards the Southern Gas Board took a personal interest in the welfare and social activities of the employees, and their Association was blessed with some of that interest; they were very much indebted to the Board for the invitation to visit the Oxford gasworks. To all of them, he was sure, the day would stand out as another high spot in the history of the Association. He would conclude by asking Mr. Whitehead, the Deputy Chairman, if he would convey to the Chairman and the members of the board, their appreciation and thanks for their well known 'Southern hospitality.'

Replying, Mr. **Whitehead** said that it was his first happy duty to extend his thanks for the kind way in which the toast had been proposed. They sincerely welcomed the Association to the Oxford undertaking and considered it a privilege to meet and entertain the members. The Chairman's words, quoted by Mr. Palser, still had effect: They were keen on doing what they could for associations such as the Midland Juniors—and those were the sentiments of the whole Board. Forty years ago he (the speaker) had been a member of the Midland Junior Gas Association, and he could look back to those days with pleasure and gratitude. They were great days, and he was glad to see present Mr. W. J. Pickering and Mr. F. A. Jenkins and to know that they were still going strong. They had come to Oxford to see the President, Mr. Bentley, in his own works. They had all now seen the works; it was not as up-to-date as they would like, and the carbonising plant was old fashioned. But it was a first rate works, economically and efficiently run, and they were proud to have the undertaking in the area of the Southern Gas Board. It had laboured under tremendous difficulties, and its prosperity was a tribute to Mr. Alexander Tran and his staff. They had come to do honour to their President, and he for one was delighted to see Mr. Bentley in that position; they held him in high esteem, both as a man and as a gas engineer. He thanked them for the cordial toast and, in turn, hoped that the Association would prosper and go from strength to strength. Anything the board could do to help in the future would be regarded as an equal pleasure.

Value of Membership

Proposing the toast of the Midland Junior Gas Association, Mr. **Alexander Tran,** General Manager of the Southern Gas Board, Northern Division, said he considered it a great honour and he had accepted the invitation to propose the toast not only because he was a former member of two other Junior Associations, but because he had a high admiration and affection for the Midland Juniors. On the few occasions on which he had been privileged to attend their meetings, he had done so with great pleasure. This was a toast which had been proposed for many years, and it was difficult to find a new approach. Perhaps Mr. Whitehead had given a key when he mentioned that he was a past member. It was always extremely difficult to assess the real value of membership of such an Association. One attended visits and meetings and found the experience instructive. But the privileged position now held by Mr. Whitehead gave an indication of the benefits to be obtained, and there could be few well-known men in the industry who had not at some time been members of the Junior Associations. Nationalisation had cast a cloud over the future of the Junior Gas Associations, but he hoped that they would continue in the future as in the past; it would be a mistake to become a junior branch of the Institution. Proposing a toast usch as this would be all wrong if it were not coupled with the name of their worthy President. He and Mr. Bentley came to Oxford in the same year and had worked together as a pair. He could not speak too highly of his assistance and had had no hesitation in recommending him for the position he now held.

Responding, the **President** said it was a proud moment to have them all at Oxford and to show them his works and part of that famous City. It was the greatest event in his Presidential year, and when he thought of the distances most of them had travelled he would be hardly human if he did not take their numbers as a compliment. The Association was really flourishing. Enthusiasm was its backbone and although all the Junior Associations were noted for the enthusiasm of their members, he was sure that the Midland members were exceptional. Active membership entailed some sacrifice of leisure time, and, in most cases, some expense, while to present a paper to their standards meant that the reader had to devote weeks or sometimes months to concentrated work. What was the reward? There was no direct reward other than prize medals for the few. Why did they

(*Continued at foot of page 384*)

Trades and Television Display

Our photograph shows the stand of the West Midlands Gas Board at the National Trades and Television Exhibition held at Bingley Hall, Birmingham. The board's colours of green, cream and maroon were used in this display and the coke fires exhibit (extreme left). Orders for 157 cookers, 22 washing machines, and 200 coke burning appliances were received.

MIDLAND JUNIORS — continued from p. 383

belong then? It was because gas engineering was a profession which got into one's blood, and made one think gas, talk gas, and often smell of gas; and one's greatest pleasure was to discuss gas in all its aspects with other gas men and pass on one's knowledge to others. The various technical associations and the Institution provided common meeting grounds and attracted members from all levels. The Junior Associations provided proving grounds for the younger men and most actively assisted in the education of the industry's technical staff, while the experiences of the older Juniors was broadened by discussion. Some Press statements had hinted that they were too self opiniated. Let that be so. They could also see some of their faults, and it could safely be said that they would be corrected. The Junior movement was a strong movement, ready to increase its contribution to the good of the industry, and to take any part requested by the boards or the technical bodies which did not interfere with its free constitution.

Proposing the toast of 'The Visitors,' Mr. **H. J. Reynolds** (Wolverhampton), Hon. Secretary of the Association, referred to the presence among them of Mr. George Mathews, Deputy chairman of the West Midlands Gas Board, Mr. S. V. Smith, Regional Director, and Mr. W. E. A. Cullum, General Manager of Morris Motors, Ltd. It was difficult to think of Mr. Mathews as a visitor; they preferred to think of him as one of them. Mr. Smith briefly responded.

The visitors then drove to the Cowley works of Morris Motors Ltd., where they were taken on a tour of inspection by Mr. R. E. T. Crouch, Works Manager, Mr. G. A. Ashton, of the Publicity Department, Mr. Howells, Chief Works Guide, and other members of staff.

The visitors were particularly impressed with the rotodip plant, which gave a rust-resisting coating to car bodies; later the shells received a coat of synthetic enamel paint from the rotospray plant and, after one tunnel drying process, were ready for moving on to the assembly lines.

Welcoming the party to tea, Mr. W. E. A. Cullum said that the management was delighted to entertain the Association, particularly as they knew that engineers were able to appreciate technical aspects of the plant and equipment, and to assess some of the difficulties which had to be faced in such a large factory organisation. From what he had heard and seen he could say that the spirit of their Association had not been unobserved, and he firmly believed that where goodwill existed, as he was confident it did in their case, there was no reason why they should not make further progress.

In thanking Morris Motors directorate and Mr. Cullum for making such an instructive and interesting visit possible, Mr. **Bentley** referred to the enormous growth of this concern, which would always be associated with the business sagacity and foresight of its generous founder. They, as engineers had been greatly interested in what they had seen, and were very much impressed. Many of them would go away with ideas of planning and planning progress which might or might not turn gas production upside down! Although this production effort was concentrated on one particular product, there were lessons on methods of production and planning from which, he was sure, they could learn something. They were indebted to the guides for their patience and readiness to answer questions, and particularly to Mr. Ashton for making the arrangements for the visit. In proposing a hearty vote of thanks to Morris Motors Ltd., he would specially like to mention the good offices of Mr. S. V. Smith, Mr. Cullum, and also Mr. Crouch, for their efforts towards making their visit a success.

Seconding the proposition, Mr. **George Matthews** remarked that in going round what was one of the most modern and best-planned works he had ever seen, he had noted the cars rolling off the assembly lines, and could not help reflecting on the fact that organisations such as this were taking the place of the older and less efficient factories of prewar years. Everything made for export was the means of bringing to this country food and vital raw materials for their industries of which they were so badly in need. It was plain to see that the Cowley works had reached a high state of efficiency in production. In addition, he had been struck by the complete cleanliness of the factory, as well as the contentment of the employees. He had seen many hundreds of workers there—and he was not unobservant in these matters—and had failed to see the slightest note of discontent, which sometimes obtruded itself among workers in other factories where bad conditions prevailed. There was no waste lying about, which showed good organisation and economy in manufacture; and they had at the Morris works at Cowley a fine example of the way in which British manufacturers were backing up the export drive for our economic recovery, which was in itself an education.

Mr. Cullum acknowledged the compliment, and before departing, the party had the pleasure of inspecting the showroom containing the newest cars and commercial vehicles; each visitor also received the story of the Nuffield Organisation in book form, which stressed its great contribution to most phases of the national war production effort.

Manchester Transport Parade

The Manchester undertaking of the North Western Gas Board staged its annual inspection parade of horses and motor transport at the Bradford Road works on May 1. Held each May Day for 38 years, this parade has been the occasion when care in the maintenance of horses and vehicles has been recognised by awards of prizes.

Mr. Harry Butters, member of the board, presided over this year's ceremony and presented the prizes. With him were Mr. John Wilson, General Manager of the Manchester Group, and other officials of the board.

Only four horses, Alfred, Teddy, George, and Prince, each a magnificent specimen, were left to take part in the parade. Motor-driven vehicles have been supplanting horses in Manchester as elsewhere. Forty-four mechanically-driven vehicles and items of equipment were inspected. Lieut.-Colonel W. H. Slack, the board's Transport Officer, judged the entries.

No fewer than 26 out of 28 drivers (approximately 93%) who competed in the Royal Society for the Prevention of Accidents 1949 competition qualified for the Society's awards and were presented with them.

York Presentations.—At a concert organised by the York Gas Social and Athletic Club, at the Club premises, on April 29, a cup and other prizes won by competitors in the annual Easter Monday walking match were presented by Mr. H. E. Bloor, President of the Club.

A Memorable Visit to Stoke-on-Trent

Sir Edgar Sylvester Inspects Etruria Works

PART of the West Midlands area, including Birmingham, Smethwick, Oldbury, West Bromwich, Stafford and Stoke, was visited last month by Sir Edgar Sylvester and Col. H. C. Smith, Chairman and Deputy Chairman of the Gas Council. At Smethwick the opportunity was taken to see the house that Murdoch lived in for a short time at the Soho Works and the remains of the small gasholder which was built in the days of Boulton and Watt.

Following a tour of the Etruria gasworks and the Spode factory of W. T. Copeland and Sons, Ltd., Stoke, on April 19, in which they were accompanied by Mr. G. le B. Diamond, Chairman of the West Midlands Gas Board, the visitors were entertained at luncheon in the Town Hall, Stoke.

Other guests at the luncheon included Sir Ben Smith (Chairman of the West Midlands Division of the National Coal Board), Sir Francis Joseph, Bart., the Lord Mayor of Stoke-on-Trent (Alderman Dr. A. P. Spark), the Mayor of Newcastle (Alderman W. Evanson), officials of the British Pottery Manufacturers' Federation, and representatives of the gas industry.

At the Etruria works. Left to right: Mr. J. E. Stanier, Colonel H. C. Smith, Sir Edgar Sylvester, Mr. J. S. Warrilow, and Mr. G. le B. Diamond.

Proposing the toast of 'The Lord Mayor and City of Stoke-on-Trent,' Mr. **Diamond** referred to the district's varied industries. He noted, he said, that the pottery industry, assessed before the war at £13 mill. now had an estimated output of £32 mill., a great proportion going to dollar countries. This was helping to pay for our food and other materials.

Turning to the mining industry, Mr. Diamond said that North Staffordshire produced annually some 6½ mill. tons of high quality coal, so greatly desired by industry—and particularly by the gas industry. He was pleased they had been able to establish such cordial relations with Sir Ben Smith and the National Coal Board.

Mr. Diamond continued: 'Stoke-on-Trent Corporation has many successful enterprises to its credit, but I think I may truly say that one of the most outstanding has been that of the gas undertaking, which the West Midlands Gas Board was pleased to take into its organisation last May. Its expansion of output and its sound policy of low tariffs has been of outstanding benefit to the expansion of your staple industry. I do not suppose any industry had undergone such radical changes in the past 20 years, changes which could not have been accomplished without plentiful and cheap supplies of town gas.

'Following the first tunnel kiln to be fired by town gas in 1932, the gas used for your industry grew to 36 mill. cu.ft. in 1933, but it is now just 100 times greater at 3,600 mill. for the past year, when we had approximately 160 tunnel kilns using town gas.

'I am sure that my friends in the ceramic industry will realise the tremendous task of the management of your gas undertaking in planning and organising such a phenomenal development in gas supplies, which have been increased by 100% in the past five years. At no time has there been any failure in gas supplies, or a reduction in pressure—even during the nightmare winter of 1947, and this itself is a highly commendable achievement.'

Tribute for a 'magnificent job of work was paid by Mr. Diamond to Alderman Percy Williams (Chairman of the Stoke-on-Trent Gas Committee before nationalisation), Mr. J. E. Stanier (Divisional Manager), Mr. J. S. Warrillow (Engineer and Manager, Stoke-on-Trent District), the members of the former Gas Committee, officials and engineers.

Remarking that the West Midlands Gas Board was now pursuing, as diligently as possible, a further extension at the Etruria Gasworks, expected to cost £1,500,000, which would add a further 8 mill. cu.ft. per day to the capacity of the works, Mr. Diamond said: 'I can only ask our many friends to exercise a little patience until our schemes come to fruition.

In conclusion, Mr. Diamond said that he believed they might claim that in a few years time the Potteries would be practically free from smoke, at any rate, from industrial smoke. The domestic consumer was a harder nut to crack, but even such a conservative class as the housewives had increased their gas consumption since 1939 by some 80%, which showed how much they appreciated the commodity.

Responding, the **Lord Mayor** said that it was sometimes forgotten that North Staffordshire had a small but rich coalfield, whose coal gave off a long flame so necessary for the firing of pottery products. Industrial smoke in the area was being reduced to the benefit and comfort of the people.

Mr. **A. E. Hewitt** (President of the North Staffordshire Chamber of Commerce and a member of the West-Midlands Gas Board), proposing 'The Visitors,' said politics never entered into the deliberations of the West Midlands Gas Board; it was concerned only with efficiency, better production, and cheaper gas.

High Sense of Public Spirit

Sir **Edgar Sylvester,** responding, said that his visit to North Staffordshire had been a very memorable and happy one. Referring to his inspection of the Etruria works, he said: 'We looked around one of the best gasworks I have ever seen. That is something to the credit of Stoke-on-Trent. It is beautifully laid out and kept, and we were very pleased with it indeed.' He knew that relations between Stoke-on-Trent and the West Midlands Gas Board had been of the happiest. That showed a high sense of public spirit which was very much appreciated.

Referring to criticism of nationalisation, Sir Edgar said it seemed to be assumed that because an industry was nationalised it was highly centralised.

In the gas industry they were very highly decentralised. Not only were the operational functions entirely centred on the area boards, without control from the Gas Council, but the area boards themselves had taken the lesson to heart and had decentralised and devolved authority on to smaller units.

In that way he believed the problem of the large-scale authority could be faced. He was not saying the gas industry was all right and other industries were wrong. There was, in fact, a far greater degree of decentralisation in the coal industry than was generally realised.

At the same time, whether it was coal, electricity or gas, it was a very big problem and one could not expect it all to come right in five minutes, but it would come right in time with hard work and patience on everybody's part.

Eastern Association Re-Visits Felixstowe

Future Status as a District Section

THE 117th General Meeting of the Eastern Association of Gas Engineers and Managers was held at Felixstowe on May 5, under the Presidency of Mr. C. E. Grimwood, Engineer and Manager of the Sudbury District, Ipswich Division, Eastern Gas Board. The attendance was well up to the average for the May meeting and apart from the fact that the dry side of Britain did not entirely maintain its reputation the meeting was one of the happiest and most successful in the long series of the Association.

The meeting was preceded by a reception and dance at the Felix Hotel on the Thursday evening by the invitation of Sir John Stephenson, C.B.E., J.P., Chairman, and members of the Eastern Gas Board. Guests were received by Sir John and Lady Stephenson and the President and Mrs. Grimwood. The golf trophies were presented by Mrs. Grimwood and the thanks of the guests were voiced by Mr. B. Clarke, J.P., Stamford.

Civic Welcome

At the opening of the business session on the Friday morning, Councillor **T. C. Eaton,** J.P., Chairman of the Felixstowe Urban District Council, on behalf of the Council and the town, extended a hearty welcome to the members of the Association and expressed good wishes for an enjoyable visit and a successful meeting. He recalled that the last time the meeting was held at Felixstowe was in 1911, when Mr. F. M. Paternoster, Engineer, Manager and Secretary of what was then the Felixstowe Gas Light Company, was President.

The **President,** Mr. C. E. Grimwood, acknowledged the welcome and in turn extended a welcome to Sir John Stephenson, Mr. N. G. Appleyard, President of the Manchester District Association of Gas Engineers, Mr. A. G. Higgins, Assistant Secretary of the Institution of Gas Engineers, Mr. G. W. Izard, of the Ministry of Fuel and Power, Mr. J. T. Brookes and Mr. R. W. Hilham, President and Secretary of the Eastern Junior Gas Association, and Dr. A. C. Monkhouse. Among those who sent apologies for absence were Sir Edgar Sylvester and Colonel H. C. Smith, Chairman and Deputy Chairman of the Gas Council, Mr. C. H. Chester, Mr. F. M. Birks, and Dr. W. T. K. Braunholtz, President, Vice-President, and Secretary of the Institution of Gas Engineers, Mr. H. F. H. Jones and Mr. S. Smith, Chairman and Deputy Chairman of the East Midlands Gas Board, Mr. J. H. Dyde, Vice-President of the Institution, President of the Southern Association, and Deputy Chairman of the Eastern Gas Board, Mr. E. C. Woodall, member of the Eastern Gas Board, and Mr. R. N. Quirk, Mr. G. C. Hyde, and Mr. J. S. Smith, of the Ministry of Fuel and Power.

Special regret was expressed at the absence through illness of Mr. W. J. Collins Garrard, of Ipswich, and sorrow was expressed at the death during the year of Mr. F. C. Brockway, Past President, and Mr. W. T. Hallam.

On the proposition of the **President,** seconded by Mr. **T. C. Battersby,** Senior Vice-President, the following new members were elected: Francis D. Drake (Greetland, Halifax); Robert S. Falkner (Ipswich); James S. Marshall (Lincoln); and Eric Williams (Norwich). The new members were welcomed by Mr. Grimwood.

Resignations were received from Mr. H. J. Randall (Camberley), a member since 1915, now outside the Association's area, and Mr. G. Stevenson (Long Eaton), a member since 1925, who had retired from the profession.

The **President,** as the Association's representative on the Council of the Institution of Gas Engineers, reported on the work of the Institution, mentioning the opening on the previous day of new headquarters at 17, Grosvenor Crescent, and the decision to seek a supplementary Charter embodying certain alterations to the wording of the original Charter to ensure that the Inland Revenue authorities regarded the Institution as a charitable organisation. He referred also to the Gasworks Effluents Committee which was taking the place of the former Liquor Effluents and Ammonia Committee, and to the steps being taken by the Safety Rules Committee to prepare codes of practice for the safe operation of purifiers and boosting plants.

Future Status

The **President** recalled that at the Clacton meeting last year a resolution was passed to take steps to become a District Section of the Institution. At that time the rules for the formation of district sections were only in draft form, and they were subsequently considerably amended. Representatives of the District Associations met the General Purposes Committee of the Institution and agreed on a final draft. That final draft had been considered by a committee consisting of the Council and Past Presidents of the Eastern Association, set up for the purpose. It was now recommended that application should be made forthwith for incorporation as a District Section of the Institution as from July 1.

Mr. **J. Hunter Rioch** (Divisional General Manager, Cambridge) formally moved the resolution, which was seconded by Mr. R. A. Weston (Divisional General Manager, Norwich) and carried unanimously.

The **President** drew attention to the fact that the usual election of officers had been omitted from the agenda because according to the final draft rules for the district sections it was for the Institution to appoint the first officers of each newly-formed section. The Institution had promised that in this matter they would as far as possible observe the wishes of the members of the Association making the application. It was, therefore, not in their hands to proceed with the election of officers but the Council proposed that all members should have the opportunity of submitting names. Nomination forms would be circulated by the Secretary, and it was desired that these should be returned by June 10.

Mr. **Philip Wedgwood,** Production Engineer, Watford Division, Eastern Gas Board, then presented a paper entitled 'Operation Effluent,' which will be reported later in the *Journal*.

The business session was followed by the Association luncheon at which a number of guests were entertained.

Mr. **T. C. Battersby,** Senior Vice-President, proposing the toast of the guests, said this was the last occasion on which they would meet as the Eastern Association, but he hoped that in the new era they would still find people who would honour them with their company at their annual gatherings as the Eastern District Section of the Institution. Such meetings were of great use to the industry and he trusted they would continue to merit the support of the area boards. The principal guest was Sir John Stephenson, Chairman of the Eastern Gas Board, who, though he had not been a gas man all his life, had been in great measure responsible for the industrial negotiating machinery established in this country today. Throughout his long career it had been said by many that Sir John had gained the respect of the employers and the confidence of the employees.

He also welcomed Dr. A. C. Monkhouse, Deputy Director of Fuel Research; Mr. G. W. Izard, Regional Director of the Ministry of Fuel and Power; Mr. N. G. Appleyard, President of the Manchester Association; Mr. Brookes and Mr. Hilham, President and Secretary of the Eastern Junior Gas Association; Mr. R. H. Epps, Secretary of the Eastern Gas Board; and Councillor T. C. Eaton, Chairman of the Felixstowe Urban District Council.

Tribute to Pioneers

Sir **John Stephenson,** responding, said the meeting that morning had inspired him and given him the feeling that so long as they had men of the type he had been privileged to meet the future of the gas industry in the Eastern Area was assured. He had been particularly pleased to meet Mr. Paternoster and Mr. C. G. Grimwood, father of the present President, both of whom had made their contributions to the progress of the industry in the past. It had been said that we were living in a very complex age, but every age had called for courage and great personal sacrifice in the discharge of duty, and he was never tired of directing the attention of his younger colleagues to the work of those who had gone before. He counted it a privilege to have had the presence of the Chairman of the Felixstowe Council present throughout the session; and, finally, he paid tribute to Mr. H. H. Redwood, who slaved long and arduously as Secretary of the Association.

(Continued at foot of p. 391)

North of England Association

THE Annual General Meeting of the North of England Gas Managers' Association was held in Newcastle on May 5, when an address was delivered by Mr. C. H. Chester, O.B.E., President of the Institution of Gas Engineers, Chairman, South Western Gas Board, before a good attendance presided over by Mr. H. Forrest, President of the Association. Luncheon preceded the meeting.

Mr. Chester's address will be given in a later issue of the *Journal*.

Proposing a vote of thanks to Mr. Chester, Mr. **J. W. Pallister** (Middlesbrough) said that they had heard a good deal about frustration since nationalisation of the gas industry, but he was pleased to say that it did not exist or, at most, scarcely existed, in the Northern area. From what he gathered from other areas, there seemed to be a much more marked sense of frustration, even to something of an alarming extent. He was, however, dubious of over-centralisation and the building-up of big headquarters' staff, for these tendencies had been so much to the detriment of other nationalised industries. Managers, added Mr. Pallister, ought to be allowed to manage.

A large headquarters' staff could result in wheels becoming clogged and the 'buck' being passed and things being delayed. He was glad to think that they were fortunate in not having those difficulties in the Northern area. Speaking of reorganisation and the effect of this on the personnel of small works, Mr. Pallister mentioned that, occasionally, the first intimation they had that such works were included in reorganisation schemes and might be closed after a period was through the Press. He thought that in cases of this sort, there was justification for further investigation into the position of the personnel of these works so that they could be given assurance as to the future.

The Association decided to make its customary donation to the Benevolent Fund of the Institution of Gas Engineers of £21 and a presentation of a certificate to commemorate his period of office was made to the retiring President, Mr. Forrest.

The following officers were elected: *President,* Mr. F. Wilson, Darlington; *Vice-President,* Mr. W. O. Kirkwood, Sunderland, who was also nominated as district representative on the Council of the Institution of Gas Engineers; *Hon. Secretary and Treasurer,* Mr. Alan S. Middleton, of Newcastle, who was warmly thanked for his services; *Hon. Auditor,* Mr. J. R. Gledson, Blyth. *Committee:* Mr. G. W. Perks, Stockton; Mr. J. G. Pope, Workington; and Mr. J. R. Porter, of Newcastle.

District Education Committee were: Mr. F. L. Scaife, of Stockton; Mr. F. Wilson, of Darlington; Mr. W. Sutcliffe, of Blyth; Mr. J. E. White, of Newcastle, and Mr. J. W. Pringle, of Newcastle. Mr. F. L. Scaife was elected to the Hovey Education Trust Advisory Committee and also Mr. W. O. Kirkwood.

Falk, Stadelmann and Co., Ltd., have introduced a new and attractive portable gas heater, the 'Rayglow.' This heater, which was on display at the Ideal Home Exhibition, is finished in deep bronze and chromium, with controls and nozzle connection at the rear. The one-piece element has a long life and with the chromium reflector radiates a wide angle of heat.

Gas Meter Rentals

At a meeting of the North Western Gas Consultative Council, in Manchester, on April 27, it was stated that a submission had been made to the council that the rentals on gas meters should be discontinued. The council discussed the matter, and decided to recommend the North Western Gas Board to give consideration to a policy of charging a rental for gas meters, but to eliminate the charge after the consumption of a specified amount of gas.

The Hoylake undertaking is at present attempting to obtain a supply from Wallasey, during the period of reconstruction, and the consultative council decided to recommend that while this position existed the price for gas at Hoylake should be the same as that at Wallasey. The present price of gas at Wallasey is 14.5d. per therm, and for Hoylake is 15d. per therm.

Methane Gas Experiment

At Point of Ayr Colliery, North Wales, experiments have been in progress for some months in the successful extraction of methane gas from unworked seams. This has been liberated by drilling, piped to the surface, and utilised in the heating of boilers in place of coal.

It is stated that one boiler which is being heated by the gas will result in the saving of about 60 tons of coal a week. The flow is continuous, and is twice as rich as town gas. Plans are in progress to heat a second boiler.

The new system is claimed to be an important technical advance that has been made in the face of intricate engineering problems. Not only is coal fuel saved, but the working of the colliery is made more safe by disposal of the gas.

Novel Huntingdon Show

More than 2,000 visitors attended a recent exhibition at Huntingdon. Devoted to careers and hobbies the exhibition portrayed many phases of the town's activities including the public services, together with fine displays by H.M. Forces. The Rotary Club of Huntingdon was responsible for the organisation, and the opening ceremony was performed by the Bishop of Peterborough.

A popular feature was the display by the Huntingdon District, Cambridge Division, Eastern Gas Board. In the setting up of the stand, the local Engineer and Manager, Mr. C. Duncan, was given assistance by his staff and workpeople, and on more than one occasion it was staffed by a number of manual personnel. Modern gas appliances were on view, including cookers, gas fires, heaters, &c., accompanied by examples of gasfitters' work.

It was fitting that Mr. Duncan's personal hobby was the construction of scale models, and among his miniatures was a complete model of the Huntingdon carbonising plant, a battery of outside producers with ancillary plant, part sectioned waste heat boilers, coke telpherage plant, and a working model of a typical gasworks steam engine.

Descriptive literature was available, and the Gas Council's film, 'The Nation's Wealth,' was screened.

EASTERN ASSOCIATION—Continued from page 390.

Mr. **Frank Allen,** Immediate Past-President, proposed the toast of the President and said that during the past year Mr. Grimwood, with the hearty support of Mrs. Grimwood, had upheld the tradition of the Eastern Association as one of the happiest and most friendly of all the District Associations. The members had been fortunate in having a man of such steady and stolid character to lead them. Mr. Grimwood's father and grandfather were pioneers of the Association, and the President himself was steeped in its traditions.

The **President,** in his reply, said he was sorry that it had been impracticable to invite the members to his home town at Sudbury. The gas industry had now passed its first anniversary as a nationalised industry, and everybody was determined to make it a success, not only for their own reputations but because of the real love they had for its prosperity. They were awaiting the first year's results just as keenly as they used to await the results of their own individual undertakings. He thanked all who had helped to make his year of office as President so enjoyable and expressed his gratitude to Sir John Stephenson and the members of the Eastern Gas Board for the previous evening's function. He thanked the East Midlands Gas Board who, at considerable inconvenience to themselves, had postponed a meeting already arranged for that day in order that as many members as possible could come to Felixstowe; and he also thanked the Council, Past Presidents, and members of the Association, and especially Mr. Redwood, for all they had done for him. He was indebted to his own staff at Sudbury, and finally he acknowledged the unfailing support of Mrs. Grimwood.

While the members were in session during the morning, the ladies were the guests of Mrs. Grimwood at coffee at Millars' Restaurant. The afternoon was devoted to an enjoyable trip in Harwich Harbour, the programme ending with tea at the Little Ships Hotel, Felixstowe Dock.

The annual golf competition for the Turner Trophy presented by Mr. D. W. Turner, and for the George Wright Cup, presented by Mr. George Wright, was played over the Purdis Heath course, Ipswich, on the Thursday afternoon. The winners were :—

Turner Trophy: F. Drake (81 net). George Wright Cup: W. Morland Fox (85 net). Competition: (1) J. Simpson (75 net); (2) T. C. Battersby (76 net); (3) C. A. McLeod (79 net). Nine Hidden Holes: C. A. McLeod.

Gas Board Chairmen 'Hard Taskmasters'

Manchester Association's 80th Annual Meeting

THE 80th Annual General Meeting of the Manchester District Association of Gas Engineers was held at the Engineers' Club, Manchester, on April 28, Mr. J. D. Ashworth, M.INST.GAS E., M.I.MECH.E. (President), in the Chair. The meeting was preceded by a luncheon attended by approximately 70 members. An apology regretting inability to attend owing to indisposition was received from Colonel W. M. Carr, O.B.E., T.D., Chairman of the North Western Gas Board; he sent his best wishes for the success of the meeting. Tribute was paid to the memory of the late F. D. Richmond (Harrogate).

The following new members were welcomed: W. N. Battersby (Ambleside); F. Littler, B.SC. (TECH), A.M.I.MECH. E. (Deputy Chief Technical and Planning Officer, North Western Gas Board); T. Nicklin, B.SC. (LOND.), A.M.I.CHEM. E. (Production Engineer, North Western Gas Board); W. H. B. Porter (Distributing Engineer, North Western Gas Board); C. H. Rickard (Leeds); T. W. B. Simpson, M.INST. F. (Construction and Maintenance Engineer, North Western Gas Board); N. C. Sturrock (York-Harrogate Group); P. Sumner (Leeds); A. Wilkinson (Hudderfield); R. Wilson, M.INST. F. (Burnley).

Independent Platform

The annual report recorded a membership of 215, a net decfease of one during the year. After referring to nationalisation the report stated that the existing area covered by the Association was not coincident with those governed by the area boards, and since the District Associations would in the future be concerned largely with the provision of independent platforms for the free discussion of technical matters, it was felt that this very desirable feature should be retained in the future reorganisation of the District Assiciation.

It had been felt for some time that the complete independence of the District Association could best be achieved by becoming a District Section of the Institution of Gas Engineers, and the Association, by resolution at a specially convened meeting, had decided to become such a District Section. While it was regretted that such an old Association had to change its form, it was, of course, essential that they should march with the times, and the management committee was satisfied that the step taken was the right one in the circumstances.

It was hoped that in addition to providing independent platforms for technical discussion, the facilities which had been available in the past for organised visits to members' undertakings and plant manufacturers' works, would be afforded by the boards, and also the opportunities for social intercourse which had formerly prevailed.

On the recommendation of the committee the meeting voted a donation of 35 guineas to the Benevolent Fund of the Institution of Gas Engineers.

Mr. N. G. Appleyard (Leeds) was appointed District Member on the Council of the Institution of Gas Engineers for the year 1950-51. Messrs. H. Platt (Bolton) and A. Cole (Huddersfield) were appointed representatives on the Councils of the Manchester and District and Yorkshire Junior Gas Associations, respectively. Messrs. J. H. Clegg (Oswaldtwistle), J. C. Hogg (Stretford), W. B. Harrison (Bury), and H. H. Thomas (Liverpool), were appointed representatives on the Lancashire District Gas Education Committee. Messrs. J. G. Tilley (Huddersfield), N. G. Appleyard (Leeds), H. Johnston (Member, North Eastern Gas Board), and J. M. McLusky (Wakefield) were appointed representatives of the Association on the Yorkshire District Gas Education Committee.

On the motion of the **President**, seconded by Mr. **N. G. Appleyard**, the meeting adopted the final rules and constitution of the new District Sections of the Institution of Gas Engineers, and agreed to become a District Section at a time convenient to the Council of the Institution.

Mr. **F. G. Shaw** enquired if its title would be 'The Manchester District Section.'

The **President** thought it would be.

Mr. **G. E. Currier** thought there would be no objection on the part of the Yorkshire members.

Mr. **H. Singleton** (Huddersfield) proposed and Mr. **A. K. Collinge** (Preston) seconded and it was agreed that the first officers and management committee of the District Section should be the officers and management committee elected for the current Manchester District Association year.

Induction of President

The retiring **President** (Mr. J. D. Ashworth) then formally inducted Mr. N. G. Appleyard in the Presidential chair, and invested him with the badge of office. In doing so he expressed his own appreciation of the kindness of the members in electing himself as President for the previous 12 months.

Mr. **N. G. Appleyard,** the newly-elected President, in acknowledging the honour, said he fully appreciated its importance and its significance. He would endeavour to fulfil the duties of the office to the satisfaction of the members.

Mr. **Alan H. Nicholson** (Secretary) read messages of congratulation from Mr. Alan Bretherick (former Chairman of the Leeds Corporation Gas Committee), from retired colleagues of the former Leeds Gas Department, and from the Leeds Group staff.

Mr. **Appleyard** presented the past-President's badge to Mr. Ashworth and thanked him for the way in which he had conducted all the Association meetings. During the past 12 months there had been difficult and delicate problems to be discussed, and they appreciated the way in which they had been allowed to discuss them fully and frankly.

Mr. **Ashworth,** in reply, said there were many problems to solve and it would take time to attain a level of comfort in the new form of the industry equal to that which prevailed in the past. He was convinced that that time would arrive, and that they would succeed in fitting themselves into the new positions which they were now called upon to fill for the benefit of the industry and of gas consumers at large.

Dr. **R. S. Edwards,** Chairman of the North Eastern Gas Board, said he thought that the Association had taken a wise course in deciding to become a District Section of the Institution. He could conceive of nothing more important to a great body of professional men than to be connected with a well-knit, virile organisation to speak for them, and

Left to Right: N. G. Appleyard (President of the Manchester District Association of Gas Engineers), A. H. Nicholson (Association Secretary), J. H. Clegg (Oswaldtwistle), J. D. Ashworth (Immediate Past President), A. McDonald (North Eastern Gas Board), and T. Haworth (Vice President).

to undertake the vital services necessary to the industry.

He cordially invited the members to visit Yorkshire for President's Day. He was aware that, east of the Pennines, he had been a hard taskmaster to many of those present from the North Eastern area. He was confident that Colonel Carr had been no less so in Lancashire. Nevertheless, he thought they would agree that it was well worth while, and that already they were able to realise the benefits of the increased opportunities for co-ordination and of improvement in gas service, which was the *raison d'être* of their existence. After a year's hard work he thought they were entitled to a good day off. Therefore, it was with pleasure that he invited them on behalf of the North Eastern Gas Board to visit Leeds on July 7.

The **President,** in accepting the invitation, said he was fortunate that afternoon in that he was supported by his Chairman (Dr. R. S. Edwards) his Deputy Chairman (Mr. G. E. Currier) and Mr. Alexander McDonald (Member of the board); also by the Group Managers, and by many other colleagues employed by the North Eastern Gas Board.

W. Morland Fox (W. J. Jenkins and Co., Ltd.) and T. A. Tomlinson.

The **President** delivered his Presidential Address. This was published in last week's *Journal* (pp. 327-330).

Mr. **T. Haworth** (Wigan), proposing a vote of thanks to the President for his address, said that to Mr. Appleyard had been presented a situation unknown to any of his 75 predecessors. This was the first address of a President of the Manchester Association within a nationalised industry. The first part of the address referred to a subject of paramount importance not only to the gas industry, but to the economy of the country.

It might be said that the national position had been built up on its wealth of coal resources, and similarly it might be stated that if they were to survive economically they had still to learn how to make the best use of the unmined wealth they possessed.

A long dissertation upon chemical evaluation of coal, said Mr. Haworth, was outside the scope of his present terms of reference, but he was convinced that, however apparently critical the gas engineer might be on coal supplies, his intention was good together with the object to achieve a better utilisation of the material at his disposal.

Mr. Appleyard with (right) Dr. R .S. Edwards (Chairman, North Eastern Gas Board), and (left) G. E. Currier (Deputy Chairman).

His one observation, continued Mr. Howarth, was that, coal not being of definite chemical composition, and possessing so many variables, chemically and physically, the nearer they could arrive at using one coal of one size in each plant, the more scientific could be the control. This they knew to be economically impossible, but the achievement envisaged in the penultimate paragraph of the first section of the President's address would go a long way to solving many problems, and if the gas boards could achieve 'elimination or reduction of the excessive variety in coal origin and size,' nationalisation could be said to have made a success where individually they had failed.

The second part of the address specialised in outlining the organisation in the President's own group; and for this contribution they were indebted. Many of them would use this information, and pick out the best to apply to their local conditions.

Mr. **A. McDonald** (Member of the North Eastern Gas Board), in seconding, said Mr. Appleyard had evidently given a good deal of thought to the subject matter of his address. He had chosen two subjects of fundamental importance; first, the basic raw material, coal, and, secondly, the ultimate criterion, the accountancy department; because everything must boil down to the question of £ s. d.

As the President had rightly pointed out, they could frequently obtain surprisingly good results from a comparatively poor coal simply because the previous coal used had created suitable conditions to carbonise that coal. If they went further and assumed that a simple formula was obtained, then he felt that it would be necessary to use a conversion factor to suit the varying conditions which applied in different works, so that there would be a different conversion factor in each works. In this part of the address the President had certainly given a good deal of food for thought.

Nationalisation had involved them in many changes. In the second section of his address the President had dealt with one factor which many former municipal engineers had had to suffer. The split responsibility to which Mr. Appleyard had referred was a most irritating feature in the life of a gas engineer, and its elimination was really welcomed by many engineers. Oftentimes the statistics or the financial figures were not available just at the time when the engineer wanted them. Mr. Appleyard was to be congratulated on the organisation he had built up and which worked so smoothly in so comparatively short a time.

The **President** suitably responded.

Mr. **John Wilson** (Group General Manager, Manchester) proposed a vote of thanks to the retiring officers and members of the Committee. This was seconded by Mr. **H. Johnston** (North Eastern Gas Board), who mentioned the names of Mr. James H. Clegg, A.M.I.MECH. E. (Oswaldtwistle), Mr. H. Platt, M.I.STRUCT.E. (Bolton), and Mr. A. K. Collinge (Preston), who had served the Association continuously during the past three years. They had rendered valuable service, and it was understood that Mr. Clegg was undertaking further duties as Hon. Treasurer.

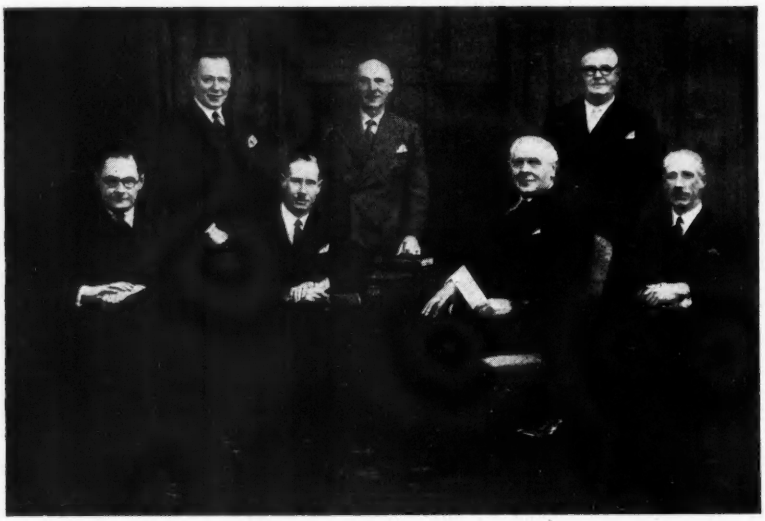
Mr. **F. C. Shaw** proposed, and Mr. **A. K. Collinge** seconded, the appointment of Mr. J. H. Clegg as Hon. Treasurer. This was carried unanimously.

National Wages Structure.—The National Joint Industrial Council for the Gas Industry, at a further meeting on April 26, continued its discussions regarding a national wages structure for the industry consequent upon nationalisation. It was agreed to establish standard rates of pay for the lower paid worker of 2s. 6½d. per hour in the metropolitan area and of 2s. 4½d. and 2s. 3d. per hour in the provincial areas. Further discussions will take place in the areas to decide how these rates shall operate in various works.

Centenary of Alder and Mackay Ltd.

IT has been said that the joy of growing old lies in growing old together. Today, as 'centenarians' of one year's standing, we join our readers in congratulating Alder and Mackay, Ltd., of New Grange Works, Edinburgh, who are now 'a hundred years young,' in their service to the gas industry. 'A hundred years young' is the phrase with which the Company have introduced a centenary brochure which gives a brief outline of the history of an organisation which it is claimed is today 'as fit as a fiddle, young in ideas and enterprise, and equipped with up-to-the-minute machinery and plant.'

The Company was first established as gas meter manufacturers when Mr. Henry Alder and Mr. John Fullerton broke away from Cochrane and Company in 1850 and started business on their own in a modest workshop called Abbeymount Works, Edinburgh. During its first years, manufacture was confined to wet meters, but by the time Mr. Alder was joined by Mr. Alexander Mackay in 1871 greater interest was being shown in meters of the dry type, and Henry Alder had already patented the first dry meter in a cast-iron case.



The board of Alder and Mackay, Ltd. Standing (left to right): Messrs. J. R. W. Alexander, M.A., LL.B.; Joseph L. Bennet; John B. Clay. Sitting: Alastair M. Grant; Harold E. Bennet, M.C.; J. Miller Thomson, W.S. (Chairman); Stanley Bennet.

The brochure records that the period of really rapid expansion started in 1875 when upon the death of Mr. Alder, Mr. Mackay assumed as partner Mr. Joseph Bennet. With the help of two junior partners, Messrs. John Bennet and John Mackay, a strong team was developed, and with the introduction of the change wheel P.P. meter they went from strength to strength, enlarging their field of connections even to the far colonies of the Empire. After this period of intense expansion the Company suffered the grave loss of all four of these competent and successful principals in the short period of nine years—the death of Mr. Joseph Bennet in 1913 being followed all too closely by the deaths of the other three during the years 1918-23. This series of shocks threw a severe strain upon the remaining staff, but proof of the inherent strength and resilience of the business may be found in the fact that not only did it survive this crisis, but continued to grow to such a degree that 10 years later its output for the years 1933-34 was a record in the history of the firm. That this success was in no measure due to the staunch loyalty of the Company's staff was evidenced in the same year when the Company presented long-service certificates to no fewer than 120 men with over 30 years' service, of whom 21 had exceeded 40 years.

Some of the more noteworthy milestones along the road of progress have been the removal of the firm to its present factory in 1890; the opening of works at Bradford in 1895; the establishment of a New Zealand factory in 1910 by the late Mr. John Bennet; the production of the millionth meter in 1916 and the two-millionth in 1945; the conversion of the firm into a limited liability company in 1917; and the opening of the London branch in 1921.

During the recent war the firm made an important contribution by producing millions of fuses, tracer shell bases, and bomb tails. Apart from these mass-produced articles, however, it has been fortunate enough to keep together a staff of highly skilled craftsmen, who have been responsible for the more 'hand made' forms of production; for example, highly finished test gasholders, gauges, 'Lord-Mayor' street lanterns, heavy and specially finished gun metal casting jobs for the Royal Navy, and many similar items which demand highly skilled men, efficient and up-to-date machines and expert supervision.

The Company today has active branches in London, Bradford, Belfast, Newcastle, Manchester, Cork, Wellington, N.Z., and Christchurch, N.Z. It also has two subsidiary companies—David Grant and Co., Ltd., meter manufacturers, Edinburgh, and Vanda Meters, Ltd., of Nelson, Lancs. One factor contributing to the achievement of a record turnover last year is the automobile department, which has been developed extensively in recent years. This work as repairers of motor car radiators, of which the firm was one of the largest in Scotland before the war, has been extended to cover all body work of both commercial and private vehicles.

The present Chairman of the Company is Mr. J. Miller Thomson, W.S., and among the directors is Mr. J. R. W. Alexander, M.A., LL.B., former General Manager of the British Gas Council and Executive Chairman of the Gas Engineers' Guild.

Gas Stock Values

Values of stocks in 15 more gas companies were announced by the Ministry of Fuel and Power on May 1. Conversion into gas stock took effect from that date, the first anniversary of vesting date, and where the interim amounts of interest already paid do not equal the full interest due on the gas stock the difference will be met by the Gas Council about the middle of next month. Details of the new valuations are as follows:

COMPANY	VALUE
Cannock 7% Stand. Ord. (£1) ...	30/–
Cardenden Ord. (£1)	46/8
Cefn Mawr and Rhos-y-Medre Ord. (£1)	29/–
Dollar Ord. (£1)	15/–
Garw and Ogmore 7% Max. Ord. (£10)	£14
Inverkeithing 6% Red. Cum. Pref. (£1)	21/–
Do. Ord. (£1)	48/–
Kirkconnel Ord. (5s.)	25/–
Llangollen 5% Cum. Pref. (£5) ...	£5/12/–
Do. 5% Cum. Pref. (£5 shares, £3 10s. paid)	£3/18/5
Do. Ord. (£5)	£5
Manningtree and Mistley 5% Pref. (£5)	£5/14/–
Do. Ord. (£5)	£7/10/–
Northallerton Ord. (£5)	£8/2/6
Skelmorlie and Wemyss Bay Ord. (£5 shares, £2 10s. paid) ...	£3/10/–
Stanhope Ord. (£5)	£1/10/–
Stocksbridge 10% Max. Ord. (£10) ...	£22
Do. 7½% Max. Ord. (£10) ...	£17
Stornoway 5% Pref. (£1)	20/–
Do. Ord. (£1)	40/–
Stranraer Ord. (£1)	35/6

Coal Output.—Total production in the mines during the week ended April 29 declined from 4,434,700 tons in the previous week to 4,391,500. A further drop in manpower during the week ended April 22, from 702,100 to 701,800, was accompanied, however, by a noticeable increase in overall output per man-shift from 1.11 to 1.2 tons. Gas available at gasworks in the week ended April 23 totalled 10,624.4 mill. cu.ft., against 10,072.2 mill. in the week before. Electricity supplied to the public over the same period rose from 956.4 mill. to 974.8 mill. units.

Gas-Engine Driven Heat Pumps and Evaporators

By S. B. JACKSON, Consulting Engineer

THE best method of developing gas space heating with economy to the gas consumer and the gas undertaking is by means of gas-engine driven heat pumps. In addition to offering attractive economies to the former, it has the advantage that the gas demand for a given quantity of effective heating is substantially reduced, proportionately reducing the capital investment upon gas manufacture, transmission, and distribution. In Switzerland and America, electric and diesel-driven heat pumps have made considerable progress. The American gas industry is now establishing manufacture of gas-engine driven machines in competition with the object of securing its share of the space heating demand. This situation will ultimately prevail in this country, and it is essential for the gas industry to institute active research and development of equipment which sells its own primary product, in readiness to meet it. Hitherto, the absorption principle of cooling was almost entirely relied upon by the gas industry. The heat pump compression system produces heating or cooling at will.

It is not sufficient to argue that the heat pump is high in initial capital cost. While industries continue to think in terms of 'one off' it always will be so. Taking advantage of mass production is the principal method of reducing it, as is evidenced in so many other industries engaged either in civil or military fields.

The following is an outline of general principles of the heat pump, which is a machine for extracting low grade heat from nature, raising its temperature, and making it suitable for heating purposes. Sources of heat are the ambient air, rivers, lakes, canals, the sea, industrial wastes (recuperation), &c. The principle is illustrated in Fig 1.

In the closed circuit A B C D, a heat-transfer medium circulates. Such media have three phases: Liquid, saturated gas, and superheated gas. Liquid passing expansion value D is reduced in pressure, its temperature falls, and it changes into a gas in evaporation A. It is then at such a state that heat is transferred to it, thus abstracting heat from the water at the inlet temperature of 40° F. The compressor does work upon it, raising its temperature, enabling it to be condensible

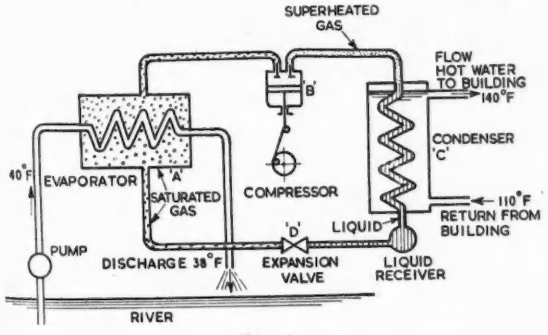


Fig. 1.

at C, where it gives up the heat taken in from the water and the heat of compression to the water of the heating system.

The fundamental Carnot equation is $\frac{T_1}{T_1 - T_2}$. Values shown on Fig. 2 give $\frac{600}{600-500} = 6.0$, which is known as the 'co-efficient of performance.' Fig. 2 shows that for the expenditure of work in the shaded area F B C E (= 1.0) heat energy A B C D (= 6.0) is now made available, the balance of 5.0 being abstracted from nature. The smaller $T_1 - T_2$ the greater the heat pump output obtained.

Considering an electric motor of efficiency η_m of 93%, a compressor efficiency η_c of 76%, and a heat exchanger efficiency η_{he} of 95%, then C.O.P. $\times \eta_m \times \eta_c \times \eta_{he} = 6.0 \times 0.93 \times 0.76 \times 0.95 = 4.0$, meaning that the heat pump delivers four times as much heat to the building as is contained in the equivalent thermal input to the electric motor. So for each 1 kW input we get 4 kW output.

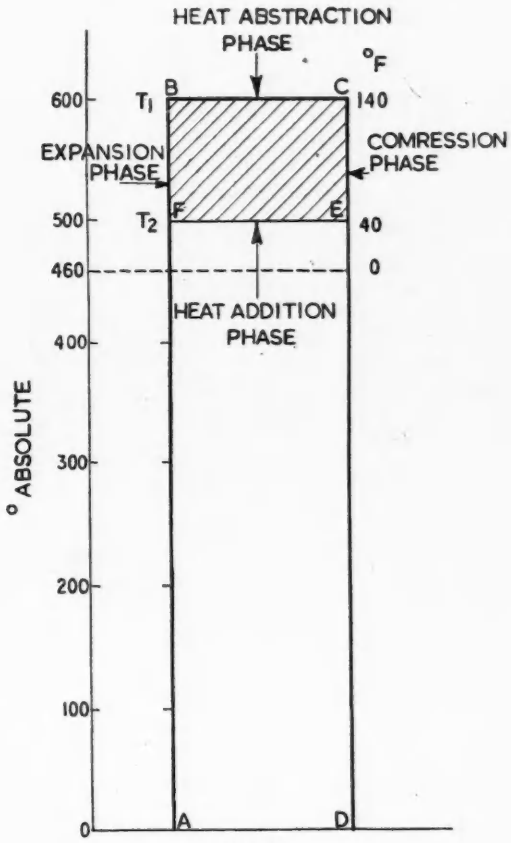


Fig. 2.

A gas-engine driven heat pump is shown in Fig. 3. It is noted that the water leaving the condenser is employed to recuperate the heat from the water jacket and the exhaust gas making it available for effective heating. Evidently the gas-engine machine requires smaller evaporators and condensers for a given thermal output as compared with the electric drive. The cost of these components is roughly proportional to the total heat transferred. Hence they are cheaper. The cost per B.H.P. of electric motors is substantially lower than for gas engines. Electric motors are very reliable and their maintenance cost is low.

The performance of a standard 15.4 B.H.P. gas engine at 1,500 R.P.M. running on full load is 7,000 B.Th.U. per B.H.P. hr., giving on the net calorific value of the fuel a brake thermal

efficiency of 36.4%. The loss in the water jacket is 28.5% and in the exhaust gas 31.0% of the initial heat content of the fuel. Of the latter, 75% is recuperable. The engine is instantly convertible to fuel oil in the event of emergency, under which condition the full load consumption is 0.365 per B.H.P. hr.

Regarding an average seasonal heating temperature as 45°F. heating the return water of the heating system to 130°F., we obtain in terms of absolute temperatures allowing for heat

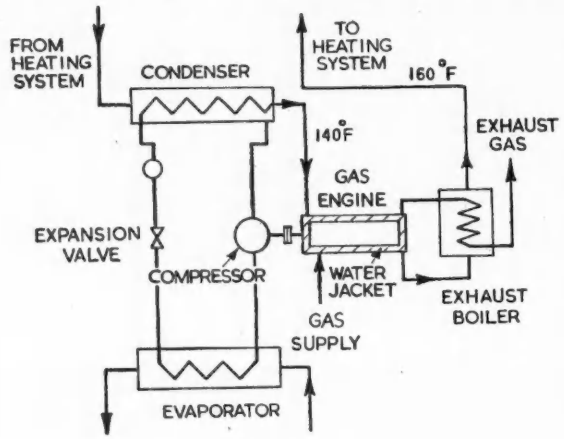


Fig. 3.

exchanger temperature differences, a compressor adiabatic efficiency of 77% and a heat exchanger efficiency of 94%,

$$\frac{600}{600-495} \times 0.77 \times 0.94 = 4.26$$

$4.26 \times 36.4 = 155.5$.

And 155.5 + 28.5 + 23.5 = 207.5% output compared with 100% calorific value of fuel.

output compared with 100% calorific value of fuel.

	%		*B.Th.U. per B.H.P. hr.*
HEAT IN FUEL	100.0		7,000
SHAFT WORK	36.4	4.26×2545	10,850
WATER JACKET	28.5		
EXHAUST GAS	$31.0 \times 0.75 = 23.5$	52.0	3,640
			14,490
$15.4 \times 14,490 =$			223,000 Final Output.

Using 450 B.Th.U. per cu.ft. calorific value.

$$\frac{15.4 \times 7,000}{450} = 240 \text{ cu.ft. gas} = 1.08 \text{ therms}$$

1.08×12.0d. per therm = 13.0d. hourly cost.

$$\frac{13.0}{2.23} = 5.85\text{d. per therm of effective heating.}$$

Taking an electrically driven heat pump with a motor efficiency of 88.5%, the coefficient of performance reduces to $4.26 \times 0.885 = 3.48$, and $\frac{223.000}{3.78} = 59,000$ B.Th.U. per hr. or 17.3 kW. input to motor. At 1.0d. per kWh. $\frac{17.3}{2.23} = 7.75$d. per therm of effective heating, indicating that the gas-engine driven heat pump produces heat 25% cheaper than electricity *under these conditions.* In other circumstances, the electrically driven heat pump has certain economic advantages of which that industry is well aware. The electricity supply industry has a number of heat-pumps operating in power stations apart from the Norwich heat pump. Research is also proceeding in other directions on electrically driven machines using various heat-sources.

For a gas-engine driven heat pump 1.08 therms requires about 33 lb. coal from which will be left 16 lb. saleable coke and 3 lb. breeze, in addition to residuals. The electrically driven machine requires 1.425 lb. coal per kWh. and at 22.0% generation efficiency, 85.0% overall transmission and distribution efficiency gives 29.3 lb. coal delivered to the power station with no residue of any kind, except ash, thus emphasising the national economic importance of developing the gas engine driven heat pump.

Compared with 1.08 therms delivering 2.23 therms of effective heating from the heat pump, the same thermal energy at an average efficiency of present gas heating apparatus delivers only 0.65 therm of effective heating. The heat pump, therefore, delivers 3.44 times this amount for the same amount of gas consumption. But, further, existing space heating costs about 20.0d. per effective therm, as compared with only 5.85d. by means of the heat pump.

A mass produced gas-engine driven heat pump complete with special thermostatically controlled unit heaters would cost at a maximum £1,250 installed, if moderately supported by the industry. It is futile to expect such a price without such support, for the cost of jigging, &c., of compressors, heat-exchangers, unit heaters, may reach £50,000. On the other hand, with such outputs as are envisaged by the author, the price could be substantially less. A 225,000 B.Th.U. per hr. heat pump would find very wide industrial and commercial application. Considering the larger sizes, when manufactured in relatively small numbers, the price per unit output falls even further.

For a mean effective heating load of 1.25 therms, 3,000 hours per annum at 5.85d. per effective therm, the annual bill is £91. Existing hearth type gas fires retail at 600-1,000 B.Th.U. effective output per £; taking 800 B.Th.U. per £ for 223,000 B.Th.U. requires £280. At 20.0d. per effective therm the annual bill for the same load conditions is £312.

Equating £1,250 + £91 *x* years
£280 + £312 *x* years

we find the heat pump extinguishes its first cost out of savings in 4.4 years, for every year after which there is a handsome bonus. Hire purchase finance appears to be indicated.

The gas engine driven heat pump offers attractive possibilities to consumers and the industry alike. The consumer cannot be expected to exhibit interest without the encouragement or guidance of the industry. The gas-engine driven heat pump makes a positive contribution to the national fuel economy. Here is an opportunity for the industry to demonstrate that it marches with progressive thought and modern development.

The Heat Pump Evaporator

The heat pump evaporator[1] is well established, but once again the gas industry has not realised its opportunities. There is not a gas-engine driven machine in the world.

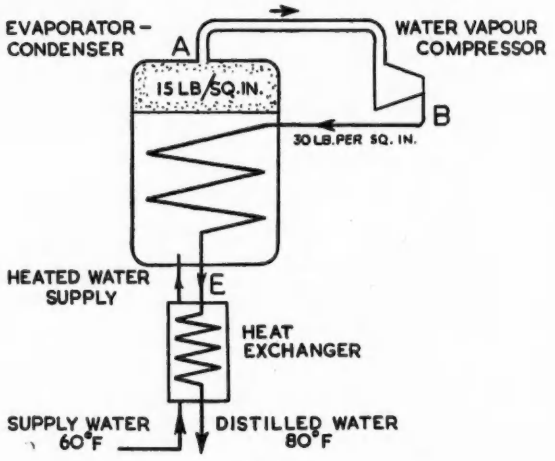


Fig. 4.

The principles are given in Fig. 4. Steam vapour at any pressure and temperature is compressed by the vapour compressor, the compressed steam being returned to the evaporating vessel via the evaporative heat exchanger, where it released its latent heat to the boiling water and was condensed. Contra-flow principles were employed. The process could be started by a small auxiliary by-pass gas heater, where the heater was in use until the required operational evaporating conditions were reached and then shut down.

The evaporator produces a distillate eminently suitable for

many industries such as laundries, textiles, rayon, chemicals, power plants, and in all locations where cheap distilled water is required.

The same fundamental equations were employed. Assuming the case given in Fig. 4, where water is evaporated at 15 lb./sq. in. Abs. 213°F., the resulting vapour being compressed to 30 lb./sq. in. 250.3°F. with an adiabatic efficiency η_c of compression of 80%, and a heat conduction and radiation loss factor η_{he} of 92.5%, then

$$\frac{250.3+460}{(250.3+460)-(213+460)} = \frac{710.3}{37.3} = 19.10$$

$$19.10 \times \eta_c \times \eta_{he} = 19.10 \times 0.80 \times 0.925 = 14.10$$

$$\frac{970}{14.10} = 68.8 \text{ B.Th.U. per lb.}$$

and $\frac{2545}{68.8} = 37.05$ lb. per B.H.P. hr.

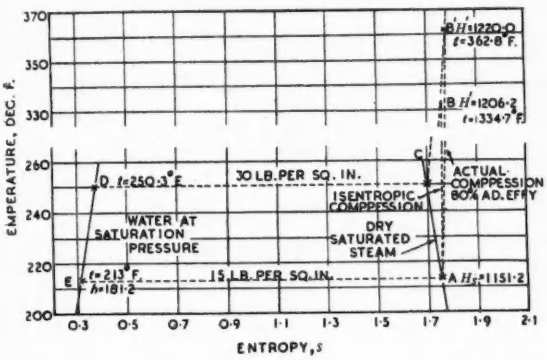


Fig. 5.

Fig. 5 shows the temperature-entropy diagram for these conditions. The energy output from the gas engine driving the compressor is equivalent to only $\frac{68.8}{1,095.2} = \frac{1}{15.9}$ of the energy required to evaporate 1 lb. water in the simplest single stage comparable distillation plant.

While such a result is excellent, the author has designed heat pump evaporators requiring only 25 B.Th.U. per lb. water distilled. Generally, it is desirable to use low temperature differences and hence low compression ratio, in order to reduce the power requirements, but, obviously, the lower the temperature differential, the greater the heat transfer area required.

High inlet pressures result in low specific volumes of steam, permitting reduction of compressor size. In the case given the specific volume of steam at 15 lb. per sq. in. is 26.29 cu.ft./lb. If, however, the pressure is raised to 50 lb. per sq. in. it is only 8.51 cu.ft. per lb. indicating that a very small compressor could be employed to handle a given output.

Consider the gas engine already referred to when running at 15.4 B.H.P. the distribution of the heat in the initial fuel is given as follows :—

	%	*B.Th.U. per hr.*
Power	36.4	39,200
Water Jackets	28.5	30,600
Exhaust Gas	31.0	33,400
Radiation, miscellaneous	4.1	4,800
	100.0	108,000

It should be noted that about 87.5% of the heat in the fuel could be effectively employed, showing the high efficiency of the gas engine as a heat generating unit when used in association with heating or evaporation. It would be pertinent to remind the gas industry that equal results could be obtained from an oil-engine prime mover.

Distilled water of high purity may now be circulated in the water jackets and through the exhaust heat boiler. Consider the 15.4 B.H.P. engine, $\frac{15.4 \times 2545}{68.8} = 570$ lb. distilled water per hour. Assuming 80°F. outlet temperature and 75% recovery from exhaust gases, then $\frac{30,600+(33,400\times0.75)}{570} =$ 98°F. rise, making a final temperature of 178°F., which is eminently suitable for many industrial processes and also boiler feed.

Consideration of a representative highly efficient triple-effect steam thermo-compression evaporator (10,000 lb. per hr.), when using initial steam at 600 lb. per sq. in., 850°F., the heat balance is given as follows :—

	B.Th.U. per lb.		B.Th.U. per lb.
Heat input to evaporator high pressure steam 1,360 lb. per hr., 600 lb. per sq. in., 850°F.	= 1,360 × 1,435	=	1,950,000
Evaporator feed 9,100 lb. per hr. at 60°F.	= 9,100 × 28	=	255,000
Circulating water 5,200 lb. per hr. at 60°F. ...	= 5,200 × 28	=	145,000
			2,350,000
Heat output from evaporator distillate 10,000 lb. per hr. at 170°F. ...	= 10,000 × 138	=	1,380,000
Circulating water 5,200 lb. per hr. at 150°F. ...	= 5,200 × 118	=	612,000
Blow-down 430 lb. per hr. at 213°F. ...	= 430 × 181	=	78,000
Conduction and radiation losses			280,000
			2,350,000

As the water is at 60°F. datum again, $\frac{1,950,000}{10,000} = 195$ B.Th.U. per lb. of water distilled, and $\frac{10,000}{1,360} = 7.4$ lb. distillate per lb. steam supplied. In this case, the distillate is only 170°F., but in the gas-engine driven heat pump case 178°F., so that in order to render the results comparable, the respective temperature rises are 110°F. (triple-effect) and 118°F. (heat-pump), and $\frac{118\times195}{110} = 209$ B.Th.U. per lb. which is over three times more than the heat-pump requirement.

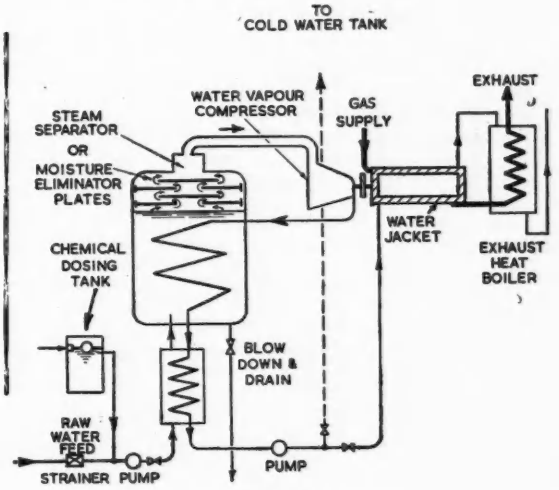


Fig. 6.

The compressor handles only pure water vapour. Nevertheless, the design of compressors for heat-pump evaporators presents a number of special problems. These are (1) high adiabatic efficiency over working range; (2) small size, weight, and cost; (3) ability to withstand high temperatures of super-

(*Continued on p. 404*)

ACCIDENT PREVENTION IN GASWORKS*

By F. A. SANDERS, M.Inst.Gas E.,
Works Superintendent, East Greenwich Works, South Eastern Gas Board.

The primary reason for accidents is undoubtedly the humane one. Nobody likes to see suffering. This, says the author, is particularly so in an industry as conservative as ours, where employees are not known as numbers but real persons whom we have known for some years. The second reason is a more practical one. No accident which entails the loss of working time can happen without some resultant dislocation of work. Thirdly, there is the need, whether it is recognised or not, to carry spare labour to cover the loss of working time entailed by accidents. Fourthly, there is always the possibility of permanent disability caused by accident, resulting in the premature loss of the employee's experience. Finally, there is the financial aspect. Since the coming into force of the Law Reform Personal Injuries Act, 1948, there has been a growing tendency for Common Law actions to be initiated following works accidents. This is a factor that is undoubtedly going to become more important.

IN discussing accidents it is as well that we should clearly understand what constitutes an accident. For the purpose of this paper, accidents are 'lost time' accidents. This means that all the accidents dealt with, and all the figures relating to them, will refer to accidents which have resulted in loss of time, by the individual, in addition to the day or shift on which the accident occurred. This is, of course, different from the usual conception of a works accident, which is that of the 'three-day or more' accident, which is notifiable to the Factory Department under the 1937 Factories Act.

To assess the frequency and severity of accidents a code has been drawn up and universally adopted, whereby frequency and severity rates are calculated, based upon the man hours worked to the following formula:—

$$\text{Frequency rate} = \frac{\text{'Lost time' accidents} \times 100{,}000}{\text{man hours worked}}$$

i.e., 'lost time' accidents per 100,000 man hours worked

$$\text{Severity rate} = \frac{\text{Man hours lost through accidents} \times 100{,}000}{\text{man hours worked}}$$

i.e., man hours lost per 100,000 man hours worked.

In assessing the man hours worked no account is taken of weekly and salaried staffs, as it is assumed that such personnel are not exposed to the same risks as hourly and shift paid employees. Where frequency and severity rates are conscientiously calculated they form—

(*a*) An accurate indication as to the success or otherwise of accident prevention work, and

(*b*) give a very useful basis of comparison between works and works or industry and industry.

All the figures quoted in subsequent data have been collected during the seven years 1943 to 1949 inclusive on a works where the average number of hourly and shift paid employees for this period was 1,600. A broad picture of the type of works is necessary to enable evaluation of the data—the carbonising plant being horizontal benches with mechanical coal and coke handling equipment, the ancillary plant being of the usual type. The works includes facilities for stocking and re-claiming large quantities of coal and coke by rail borne traffic, and extensive repair shops providing manufacturing and maintenance services for a number of works, in addition to the one on which they are situated.

Material and Physical Causes of Accidents

The following table shows the split of all 'lost time' accidents during the seven years 1943 to 1949:

Department	Percentage of all Accidents	Frequency Rate	Severity Rate
Process—Carbonising	42%	5.54	1,586
Process—Other than Carbonising	17%	2.13	523
Maintenance	41%	3.01	459

* Paper to the Southern Association of Gas Engineers and Managers (Eastern District) April 25, 1950.

An interesting feature of this table is that although the maintenance department suffered 41% of the accidents, compared with 42% for the carbonising department, the frequency rate shows that the risk and subsequent accidents in the carbonising department were really double that of the maintenance department.

Secondly, it is interesting to note that the severity rate for the carbonising department of 1,586, compared with 523 for the process outside the carbonising department, and 459 for the maintenance department, means in effect that the accidents sustained in the carbonising department have been on an average much more severe. They include, in fact, one fatality. The percentages in the first column do not give the full story, but when the frequency and severity rates are calculated to the formula quoted a true comparison can be made and the relative degree of risk can be assessed.

The next obvious step is to analyse the causes of the accidents. This leads us to:—

Tabulated Cause	C'bonis'g. %	Other than C'bonis'g. %	Maintenance %
Machinery	4.2	2.8	3.3
Vehicles	0.3	4.2	0.6
Fires	8.7	1.4	1.8
Falls of persons	24.4	18.7	21.7
Hot tar	2.6	0.0	0.0
Stepping on or striking objects ...	19.1	20.1	13.2
Objects falling	10.1	19.4	22.8
Handling objects	23.9	29.2	24.9
Hand tools	1.7	0.7	5.7
Flying particles	2.8	3.5	3.3
Poisonous and corrosive substances	0.0	0.0	0.3
Unclassified	2.2	0.0	2.4
	100.0	100.0	100.0

The most striking feature of these figures is undoubtedly that of the low percentage of the number of accidents classified under machinery. To the uninitiated, when the subject of accident prevention is mentioned, thoughts immediately fly to the guarding of machinery, but I think it is obvious from the figures given in Table 2 that the degree of risk of accidents due to machinery on a gasworks where machinery is extensively installed is not the greatest risk. This is due to the fact that for many years the guarding of machinery has been regarded as essential, in addition to the legal requirements, particularly of the 1937 Factories Act, which leaves few loop holes. If we abstract the four major causes we get the following Table:

Tabulated Cause	C'bonis'g. %	Other than C'bonis'g. %	Maintenance %
Falls of Persons	24.4	18.7	21.7
Stepping on or striking objects	19.1	20.1	13.2
Objects falling	10.1	19.4	22.8
Handling objects.	23.9	29.2	24.9
	77.5	87.4	82.6

This means that four out of five of the accidents sustained in the past seven years were avoidable, in that care and foresight on the part of someone could have prevented them.

Broadly speaking, there is a remarkable similarity in the type of accident, whether in the two sections of the process side or in the maintenance side, and I think that this emphasises the fact that these accidents are avoidable.

If we consider the four headings we have abstracted in detail, and take first—'falls of persons'—this is, as the title implies, the physical falling of persons, and broadly speaking one in every five of the 'lost time' accidents in the period under review was such a fall. It is difficult to understand how this happens. Adequate pathways, suitably lighted, are provided, but people will take short cuts. If a canteen is situated in the centre of a works, and the shortest route from a shop near the outside boundary is through tunnels and over hurdles, and a paved, tree-lined walk with grass verges is provided round the perimeter, the tunnels will be explored and the hurdles will be jumped, while the grass will gradually creep on the paved walk. One interesting feature of this type of accident is that during the period of the black-out during the war years there was no marked increase in the number of such accidents.

The next section, 'stepping on or striking objects,' somewhat smaller in number than the previous section, is self explanatory, and the larger number of these is the result of stepping on coke, stoker's tools, or similar objects left lying. To a degree the management must accept the responsibility for seeing that stages, walk-ways, &c., are kept clear.

When we consider 'objects falling,' there is a marked degree of difference between the carbonising and the other two sections, and this is what one would expect. Carbonising accidents in this section are usually the result of small coal spillage from overhead hoppers or the dropping of tools on retort house stages and the dropping of coke or tools through retort house stages. In the 'other than carbonising' section, the falling bodies are such things as coal from grabs or wagons, and coke in transit, while in the 'maintenance' section, the largest under this heading, they are usually not as one would expect—the result of objects falling from scaffolds, &c.—but the dropping of objects being carried or handling on benches, bogies, &c.

'Handling objects' is the most difficult to explain. It represents about a quarter of the total number of accidents, and the majority of these accidents are strains or sprains, about 75% of them coming under one or the other of these designations. Strained backs, about one-third of 'handling objects' accidents, frequently occur in coke loading. New employees are particularly liable to suffer such strains. During the winter months climatic conditions lead to an increase in this type of accident. It is difficult to decide then whether it is a strained back accident or lumbago. We have, of course, to accept the medical diagnosis. Other strains are caused by the unexpected muscular effort such as occurs when attempting to arrest a moving object, or the sudden easing of resistance, and there is the common source of strains—lifting. The remainder of accidents in this section are usually finger injuries, such as minor abrasions, cuts, &c., caused in 'handling objects.'

The Human Factor

An interesting study can be made of the human reaction to accident risk. This is apparent both as regards the relationship between age and accident proneness and between experience and accident proneness. The term 'accident proneness' has fallen somewhat into disrepute, as it has been asserted by certain authorities that accident proneness does not exist. This is not my view, and I feel that the term still does explain quite a lot that would be otherwise inexplicable.

Fig. 1 shows the relationship of the incidence of accidents against age, and from it quite a lot can be gleaned. The first part of the chart deals with the younger man who still has not lost his care-free boyishness and is still somewhat impetuous, in addition to being very chary of accepting advice. The middle-age groups show the effect of settling down in industry and the acquisition of a sense of responsibility. Then in the late forties we get the really mature, careful, workman. The fifties sees the onset of the slowing-up of perception and muscular reaction. This is realised, and the automatic slowing up of the man brings down the accident rate slightly in the early sixties. This is accompanied by a certain amount of alternative work for the man who is obviously past his best. This, of course, applies particularly in our own industry to the stoker.

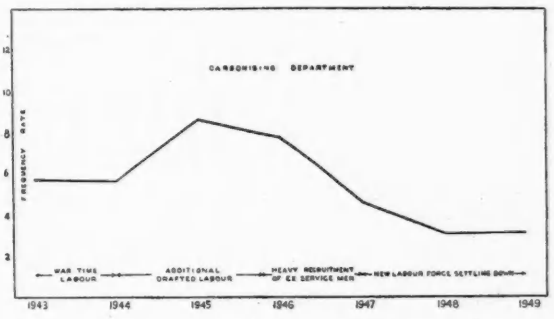


Fig. 1.

As one would expect, these facts are very closely linked to the relationship between experience and accident proneness illustrated by Fig. 2, which is a graph of the frequency rate for the carbonising department during the seven years under review. With wartime labour and the comparatively high average age of the regular employees the frequency rate was steady

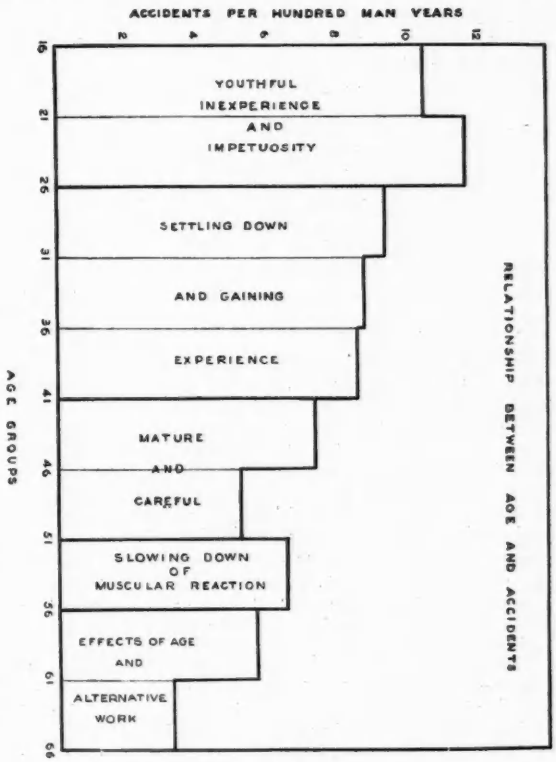

ACCIDENTS PER HUNDRED MAN YEARS
AGE GROUPS
YOUTHFUL INEXPERIENCE AND IMPETUOSITY
SETTLING DOWN AND GAINING EXPERIENCE
MATURE AND CAREFUL
SLOWING DOWN OF MUSCULAR REACTION
EFFECTS OF AGE AND ALTERNATIVE WORK
RELATIONSHIP BETWEEN AGE AND ACCIDENTS

Fig. 2.

at the somewhat high figure of 5.7. During the year 1945, owing to the extreme difficulty in getting labour, it was found necessary to draft into the carbonising department personnel normally engaged on such duties as canvassing, estimating, &c., and it is interesting to note the accident rates which this drafted labour caused:

	Frequency Rate	Severity Rate
Drafted labour accident rates	27.2	2,380
Accident rates for carbonising department as a whole for the same period	5.6	1,230

The frequency rate of 27.2 is, of course, really alarming. To put it another way, it means that if the number of employees is 40 they will have 27 accidents between them in one year.

The next period was one in which a heavy recruitment of new labour, principally young ex-servicemen, was carried out, and here again the accident proneness of this new labour was very evident. For the year 1946, 158 'lost time' accidents occurred, of which 93 were sustained by employees with less than one year's service, and of this 93, 23, or approximately 25%, occurred during the first month of work, or putting it another way, one accident in every seven, for the whole of the year, occurred to employees in their first month's service.

Another remarkable feature is the seasonal variation. The number of accidents sustained in the summer is roughly 60% of those sustained in the winter. In seeking to explain this, the type of accident sustained is similar, there is no marked variation in any one particular cause, and one can only assume the effect of climatic conditions upon muscular reaction. This however, does not explain the remarkable drop in December as Christmas approaches, and the steep rise in January after Christmas. The fact remains that as Christmas approaches the number of accidents falls, and rises again quickly immediately the festival is over.

Accident Prevention

The prevention of accidents can be divided broadly into two divisions. There is first the prevention of repetition, and, secondly, the anticipation of event.

Prevention of repetition is fairly simple. From accidents that have already happened, preventive measures can usually be taken to prevent a repetition, and the fact that such an accident has happened usually ensures the co-operation of all concerned in preventing a repetition.

When we come to the anticipation of event, it is an entirely different matter. The assessment of a risk is always difficult to put over against the criticism of established precedent and the assertion that it has not yet caused an accident.

The following are essential if accident prevention is to be effective:

1. Managerial directive.
2. Interest and education of the employees.

Managerial directive does not mean management merely giving a blessing to efforts of subordinates in accident prevention. It means the personal interest in every accident that occurs, followed up by investigation and insistence upon the prevention of repetition, and, what is most important, the instilling into subordinates an accident consciousness to develop the automatic assessment of risk before an accident happens, together with incentive to procure the elimination of such risk.

From our study of accident causes there is one very apparent fact—the majority of the accidents could be prevented by what has become to be known as 'good housekeeping.' The automatic clearing up after a job, the maintenance of obstruction-free footpaths and gangways, the prevention of overloading of wagons, are all matters which come under this heading and have a marked influence on accident figures, and they are all matters where managerial interest and drive will pay handsome dividends in accident prevention.

Regarding the education of employees, much can be done in this direction in bringing home to employees the following main facts:

1. The majority of the accidents that are suffered are avoidable.
2. The majority of the accidents are avoidable by employees themselves.
3. The employees are the principal sufferers, financially and physically, as the result of an accident.

The education of the employee, to me, does not mean plastering the works with posters. Personally, I do not think they do much good. One has to get nearer home to drive the lesson in. If posters are used, the facts on the poster should relate to the persons viewing it.

Several obvious preventive measure suggest themselves as a result of the data that has been prepared. They are such things as 'good housekeeping,' ensuring so far as possible absence of draughts where men are working in such positions as coke holes, loading coke, the standard spacing of stair treads, the standardisation of handrails, the systematic clearance of debris, and the removal of permanent and temporary obstructions.

A prevalent cause of 'handling objects' injuries, particularly to new employees, is the use of forks and shovels with rough handles, causing blisters, with the possibility of sepsis. Inspection of such tools before they are issued is desirable. The introduction of safety footwear with the steel insert toe cap was a good move in the prevention of toe injuries, and the purchase of them by employees should be encouraged. Facilities for first aid should always be available, and immediate attention should be encouraged. Quite a number of 'lost time' accidents would not have been recorded as such if immediate attention had been obtained.

Occupational Diseases

The subject of occupational disease is one where the medical profession is primarily concerned. Nevertheless, much can be done by the layman in checking such complaints. Epithelioma, or pitch warts, is of course a purely medical problem, and I do not propose to say anything further on this subject. Pneumoconiosis, however, is a disease of which we can say a good deal. The practice of using refractories with a high silica content has developed considerably in the past 30 years, and it is only now that the effects are beginning to be felt. While I am chary of discussing what is a medical problem, facts are coming to light which give a lead and enable one to express an opinion. Men may be working with this material with apparent good health for many years, when suddenly illness, when investigated, discloses that they have contracted Pneumoconiosis. The period of exposure may be as long as 30 years, on the other hand symptoms may develop after a very short exposure. I do not think that we, in our industry, appreciate the seriousness of this problem. The disease is chronic, existing preventive measures are either impracticable or ineffective, and the only satisfactory solution appears to be the substitution of high silica content refractories by alternative materials, which have yet to be found. This is a subject for research of some urgency.

Dermatitis is a term covering skin complaints. The shortage of soap during the war years, the love of the mechanic for paraffin, and the lobbyman for soda, caused quite a number of skin complaints. Strict control of the quantity of soda issued for lobby cleaning, and the banning of paraffin for hand washing are essential. Suitable hand cleansers are available and can be used to augment soap supplies. Barrier creams are favoured in some organisations, but in my opinion they fail in that—

(*a*) They must be put on the hands before work is commenced.

(*b*) Once the film is broken their effectiveness is lost.

One would expect that we, of all people, would be alive to the risk of gassing accidents, but it is disturbing to read in the Chief Inspector of Factories' Report for 1948 that four men were fatally gassed in 18 months while draining oxide purifiers. The remedy is that this job should not be done single-handed, and where the drain cocks are in confined places distance breathing apparatus should be worn.

Much valuable information can be obtained by the inspection of the logs of attention given at the first-aid dressing station. Here will be found records of all the minor cuts and abrasions, which normally are not brought to the notice of the management. It is surprising if one studies such informa-

tion how often a 'near miss' can be brought to light and the necessary action be taken before it becomes something more than a 'near miss.'

Accident Prevention Committees

One of the most effective means of combating accidents is undoubtedly that of a really competent accident prevention committee. The constitution of such a committee should be very carefully considered before its inauguration. It is essential that the chairman should be a works manager or an official with equivalent authority who would have the power to accept any recommendations made by the committee. It is desirable that the secretary should be the officer responsible for accident prevention and the implementation of Statutory Rules and Orders.

If the committee is to be effective it should have a preponderance of hourly and shift paid members, plus a nucleus of official representatives. A suggested composition is as follows:—

Chairman ... ... Works engineer or equivalent
Secretary ... ... Accident prevention officer or equivalent
Nominated members (officials) Three
Elected employees ... ... Six

It will be noted that the employee members are referred to as elected employees. I think it is desirable that in inaugurating a committee an election should take place, but once a committee has been functioning it may be found desirable to substitute nomination by the management for election, the reason being that it is very desirable that personnel serving on the committee should change quite frequently, and if the members are elected there will always be a tendency for the same person to be re-elected time and time again. Part of the usefulness of accident prevention committees is the propaganda effect which will spread through the works as a result of committee meetings, and if the membership is not changed the novelty of being able to discuss with fellow workers matters that have been discussed in committee will die very quickly, whereas if representation on the committee is limited to a period not exceeding one year, there is always fresh blood coming in, and going out into the works spreading the news. With the six elected employees it is desirable that their term of office should not end simultaneously, and such an arrangement as 12 months' service, with one member retiring every two months, ensures a continuity of interest.

Members should be encouraged to bring matters forward for discussion even though there may appear to be criticism of the management, and, however controversial the subject may be, absolutely free and open discussion should be encouraged. One criticism that is often levelled at accident prevention committees is that where a hazard has been recognised delay has occurred in no action being taken until the next accident prevention committee meeting. This, of course, is entirely wrong, and irrespective of membership of a committee, all should be encouraged to report immediately any hazard as soon as it is observed. Committee members may report such matters at a subsequent committee meeting, and also on the action taken.

Meetings should be formal in character. An agenda should be prepared and circulated and minutes should be kept and passed.

One last word on accident prevention committees. It is essential that every matter raised should be seriously considered, and the action decided upon must be followed up. Nothing will damp the ardour of an accident prevention committee, or other committee for that matter, more than to find its recommendations ignored, or, at best, receiving inadequate attention from the officials responsible for their implementation. The best means of ensuring positive action is for the chairman of the committee to be the senior works official.

Accident Prevention Officers

There is a growing tendency in industry to appoint officers charged with the specific duty of accident prevention. I must say at this point that I much prefer the term accident prevention officer to that of safety officer. While on a small to medium sized works it would not be practicable to make such an appointment a full-time one, even on a small works it should be the recognised duty of one specific person to deal with this problem, even though this work may represent quite a small proportion of his duties. The virtue of this is that there is one clearing house for matters relating to accident prevention, and secondly, and this is of major importance, there is one person who can be charged with the specific duty of inspecting plant and works generally, with the sole object of looking for hazards. Even the most experienced and conscientious official, who knows the plant inside out, can pass a hazard time and time again, as his mind is occupied with functioning of the plant itself, and not looking solely for accident hazards. The person charged with accident prevention must have adequate status, executive authority, and direct approach to the works manager.

Elimination of Risk

Accident risks must be considered in designing and installing new plant, particularly when the new plant, as so often happens in our industry, has to be installed in congested sites and marry up with existing plant. Briefly, accident prevention should start on the drawing board. Consultation between the draughtsman and the accident prevention officer may save much pain and suffering and obviate subsequent alterations.

Reference has already been made to the inspection of plant for accident risks, and I think there are one or two points in connection with such inspection that are worth some comment.

When carrying out the inspection the official will probably be wearing normal footwear, have both hands free, and be fully conscious of exactly where and how he is walking, and in this frame of mind he may quite easily pass something which to him does not constitute a risk. He may be followed, however, by a man in hob-nailed boots, or one with both hands occupied in carrying, or one whose mind is on the prospects of his local team. These are the conditions the inspector must visualise.

Inspections should be carried out not only in daylight, but during the hours of darkness. Quite a small pothole, which in daytime would not cause a second thought, can easily cause a stumble and fall at night. Lighting can play queer tricks, and an obvious obstruction in daylight might be in a dark shadow at night.

Conclusion

One could go on almost indefinitely assessing the risks associated with individual sections of plant, any one of which would provide the material for a discussion in itself. The best one can do in a short paper is to indicate the broad principles of dealing with the problem of accidents. Summarised they are:—

1. Insistence on 'good housekeeping.'
2. The training and restraining of young employees.
3. The training and protection of new employees.
4. The education of all employees.
5. When assessing a possible risk, do not say—'No sensible man would do it,' but say, rather, 'A fool might do it,' because sooner or later a sensible man will be foolish enough to do it.

In dealing with a problem, one first gathers the facts, then draws the conclusions, and finally arrives at the solution. These steps I have tried to follow in this paper. Much that has been said may be debatable, and much may be regarded as stressing the obvious, but if it has helped in any way in dealing with this very human problem, I think this paper has been justified.

I would like to finish with a homely maxim, passed on to me in my early days in the industry: 'What can happen will happen if you don't prevent it.'

OIL REFINERY PLAN

A plan for the incorporation of the oil storage, blending, and packing business carried on at Coryton in the Thames Estuary by Cory Bros. and Co., Ltd., a wholly-owned subsidiary of Powell Duffryn, Ltd., into the business carried on in the United Kingdom by the Vacuum Oil Co., Ltd., which is controlled by the Socony-Vacuum Oil Co., Inc., of New York, has been announced.

The whole of the Cory property at Coryton will be acquired by the Vacuum Oil Co. and the purchase price will be satisfied by the issue of ordinary shares in the Vacuum Oil Co. to Cory Bros. and Co. Further ordinary shares will be subscribed by Powell Duffryn and Socony-Vacuum in agreed proportions, the Powell Duffryn share of which will amount to about £3,500,000.

The board of the Vacuum Oil Co. will be enlarged to give Powell Duffryn and Socony-Vacuum equal representation. When the existing Coryton business of Cory Bros. and Co. has been incorporated into the Vacuum Oil Co. and the additional shares in the Vacuum Oil Co. have been issued to Powell Duffryn and to Socony-Vacuum, the equity share capital of the Vacuum Oil Co. will be held equally by the Powell Duffryn group and by the Socony-Vacuum Oil Co., Inc.

The thus enlarged Vacuum Oil Company will carry on the combined businesses and, in addition, will construct a new oil refinery, primarily for the production of lubricating oils. Approval has been received from the Board of Trade for the location of this refinery at Coryton, thereby permitting the use of the existing tankage and other facilities.

The new refinery will mainly treat Middle East crude oil and the resulting products will replace those at present imported from dollar sources. The capital expenditure by the Vacuum Oil Co. on the construction of the new refinery and on other works at Coryton and elsewhere will be in the region of £10 mill. This expenditure will be financed in part by the share subscriptions of Powell Duffryn and Socony-Vacuum. Discussions are in progress with the Finance Corporation for Industry, Ltd., for the provision of the balance by way of loan.

Addressing the annual luncheon of the British Electrical Development Association, Lord Citrine, Chairman of the British Electricity Authority, said that it appeared to be beyond the capacity of the British manufacturing industry to meet the demands on it for electricity plant. He said that there was no evidence yet of equipment coming from the United States, and that there had been rumours of cuts in the programme. If those were practical proposals, continued Lord Citrine, they would disappoint the electricity industry and would be disastrous to British industry as a whole. Mr. P. J. Noel-Baker, Minister of Fuel and Power, who also spoke at the luncheon, suggested that there should be an intensive drive for wider use of electrical equipment in the hours when the load was not at peak.

Vokes, Ltd., Henley Park, Guildford, manufacturers of filtration and silencing products, announce a further contribution to their export drive by the inauguration of a subsidiary company, Vokes (Canada), Ltd., located in Toronto. The new company will apart from intensifying exports in the dollar market, provide a further link in a world-wide organisation of sales and service. Vokes equipment is already being manufactured in Australia, France and America. In addition to handling the whole range of equipment, Vokes (Canada), Ltd., will also act as sole agents for the whole of Canada for a number of British companies whose products also have a world reputation. Mr. J. Parkinson, former Sales Manager of the English company, becomes Vice-President and General Manager of Vokes (Canada), Ltd. The company is exhibiting in the Automotive Building at the 1950 Toronto Trade Fair.

HEAT PUMPS—Continued from p. 397.

heat; (4) perfect vapour sealing; (5) elimination of lubricant from evaporative and distillate, circuit, with elimination of oil separators; and (6) absolute minimum maintenance cost over a long period of years. Reciprocating and sliding vane compressors do not conform to this specification. Centrifugal compressors are too expensive and are only suitable for large outputs. The author has designed a suitable machine to meet the specific requirements of evaporators from the smallest size of say 1,000 lb. per hr. up to 100,000 lb. per hr. as would be necessary in a large power station.

Evaporators may be used for the distillation of fruit juices, milk evaporation, and other applications in the food industry, making chemically pure water for chemical processes, &c. The importance of requirement (5) is emphasised.

Table 3 shows analyses of raw water supplied to a heat pump evaporation and its distillate (2).

Table 3.—Analysis of Raw Water and Heat Pump Evaporator Distillate

Condition at Time of Analysis	Raw Water	Single stage heat-pump distillate
Appearance (after filtration)	Clear	Clear
Colour	15 Hazen	5 Hazen
pH	7.3	6.3
Electrical Conductivity	385.0	5.0
	Parts per 100,000	Parts per 100,000
Lime (as CaO)	9.5	—
Magnesia (as M_gO)	1.8	—
Iron (as F_e) total	0.005	—
Silica (as SiO_2)	0.6	0.012
Chloride (as Cl)	1.2	0.01
Sulphate (as SO_3)	1.0	—
Nitrate (as N_2O_5)	1.0	—
Phosphate (as PO_4)	—	—
Free carbon dioxide (as CO_2)	2.2	—
Total solids at 180°C.	23.5	0.15
Bicarbonate alkalinity ($CaCO_3$)	17.6	—
Temporary hardness	17.6	—
Permanent hardness	3.1	—
Total hardness	20.7	—

Grains per gallon = parts per 100,000 × 0.7.

The performance equals that of the best triple-effect thermo-compression evaporator. Considering that the heat pump is only in one stage and the tests were taken under heavy overload, further comment appears superfluous.

Compared with conventional lime-soda on base exchange water softeners the apparent operating cost may appear to be excessive. These are cold processes and in order to produce distillate for hot water purposes which constitute the majority, the treated water must be raised to the required temperature suitable for the process. The cost of treatment *plus the cost of heating* will be found in all cases to be in favour of the heat pump evaporator. As a general guide, heat-pump combined evaporation/heating is 20-25% cheaper.

The employment of such evaporators places the works engineer in the position of merely specifying a given capacity of machine, knowing that the machine will perform at all times completely satisfactorily. He does not have to acquire extensive chemical knowledge or practical experience in the technique of chemical water treatment methods. The final heat pump effluent is of such high standard that it can be applied direct, in complete confidence, to the highest pressure/temperature boiler plants. Over 10,000 diesel driven machines with outputs of up to 50,000 lb. per hr. are in use in America.

Heat pump evaporators are not exempt from potential scaling. Methods are available (3) which tested by large-scale practical experience (4) over several years, in conjunction with blow-down control, permit such machines to operate over many years without any trouble whatever.

With gas at reasonable price, heat pump evaporators pay for themselves in a short period of years.

A new use for gas is placed in the hands of the gas industry.

References

(1) Jackson, S. B. 1949. Trans. I.Mar.E. Vol. LXI. No. 11 pp. 225-231 '*The Diesel Driven Heat Pump Evaporator.*' This paper gives other references to the subject and much more detailed treatment than this article.

(2) Made by S. B. Jackson upon water provided by Professor Eischelberg, Technical Institute, Zurich, 1948.

(3) Benke, A. L., 1946. Trans. I.Mar.E. Vol. LVIII. p. 161 '*Starch Injection and Evaporation Output.*'

(4) Bethon, H. E., 1949. Society of Naval Engineers; America, Vol. 61, p. 469. '*Fouling of Marine Type Heat Exchangers.*' This paper covers several thousand marine evaporators and appreciates the work done by Benke.